



Food and Agriculture  
Organization of the  
United Nations

# Promotion of Fruit and Vegetables for Health

Report of the Pacific Regional Workshop





***Cover photographs:***

Pomegranate – © Augustus Binu; Colocasia esculenta Taro – © David Monniaux; Rambutans Challiyil – © Eswaramangalath Vipin;  
Cashew apples – © Abhishek Jacob

# Promotion of Fruit and Vegetables for Health

Report of the Pacific Regional Workshop



The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISBN 978-92-5-108879-1

© FAO, 2015

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via [www.fao.org/contact-us/licence-request](http://www.fao.org/contact-us/licence-request) or addressed to [copyright@fao.org](mailto:copyright@fao.org).

FAO information products are available on the FAO website ([www.fao.org/publications](http://www.fao.org/publications)) and can be purchased through [publications-sales@fao.org](mailto:publications-sales@fao.org).



# Table of contents

Acronyms	v
Executive Summary	vii
<b>1</b> Introduction	1
<b>2</b> Background	3
<b>3</b> Meeting Report, conclusions and recommendations	5
<b>4</b> Presentations	11
<b>5</b> Kobe framework for promoting fruit and vegetables at national level	23
Annex 1 Workshop conclusions/ Group discussions	47
Annex 2 Participants	57
Annex 3 Workshop agenda	59
Annex 4 Questionnaire instructions	61
Annex 5 Questionnaire	65
References	81



# Acronyms

ACIAR	Australian Center for International Agricultural Research
AusAid	Australian Agency for International Development
FAO	Food and Agriculture Organization of the United Nations
FCT	Food Composition Table
F&V	fruit and vegetables
GAP	good agricultural practices
ICTs	information and communication technologies
IPM	integrated pest management
ISHS	International Society for Horticultural Science
NCD	non-communicable disease
OSP	Orange Sweet Potato
PARDI	Pacific Agribusiness Research for Development Initiative
PICTs	Pacific Island Countries and Territories
PROFAV	Promotion of Fruit and Vegetables for Health Initiative
SPC	Secretariat of the Pacific Community
STEPS	WHO STEP wise approach to Surveillance
UN	United Nations
WHA57.17	Fifty-seventh World Health Assembly
WHO	World Health Organization



# Executive Summary

The Food and Agriculture Organization (FAO) and World Health Organization (WHO) of the United Nations (UN) have been leading the global initiative “Promotion of Fruit and Vegetables for Health” (PROFAV) to raise awareness and to boost fruit and vegetable production, supply and consumption to improve people’s health – and farmers’ incomes. The regular consumption of a variety of fruit and vegetables is essential for a well-balanced diet and for avoiding non-communicable diseases (NCDs). Low intake of fruit and vegetable is largely attributed to unhealthy diets in developed countries, and to poverty and food insecurity in developing countries.

FAO organized a workshop to focus on South Pacific island communities. In the Pacific Island Countries and Territories (PICTs), fruit and vegetable intake is well below the recommended level of five servings per person per day, or 400 g per day. This largely contributes to the high prevalence of NCDs. Furthermore, over half the population in all of the PICTs are overweight. Alongside obesity, under-nutrition and micro-nutrient deficiency.

During the workshop, it emerged that national institutions in most countries of the region have established strategies for NCD prevention and have been implementing programmes to advocate for healthy diets and lifestyles through the increased consumption of fruit and vegetables. Nonetheless, efforts should be strengthened and greater integration of activities among horticulture, nutrition, health and education stakeholders is considered essential.

The island countries of the Pacific generally face challenges in securing year-round adequate supply of fresh fruit and vegetables. It was recognized that NGOs, civil society and especially faith-based organisations can play a key role among stakeholders in increasing awareness and facilitating programmes to improve availability and consumption of fruit and vegetables for health. It is important to join efforts and support the PROFAV initiative and become active stakeholders.

After the workshop, the participants will continue to provide more information through a survey prepared by FAO. It is recommended to encourage new development partners to join and support countries in the implementation of the PROFAV agenda and foster information sharing. One of the recommendations was to establish a PROFAV networking mechanism that will enhance the interaction across horticulture, health and education sectors within countries and among the Pacific island countries by making information available on websites and e-newsletters. This will provide a good baseline to characterize production, supply and consumption of fruit and vegetables and will allow identifying needs and areas for future intervention in the region.



Pomegranate DSW





# 1 Introduction

There is growing awareness of the fundamental and vital role fruit and vegetable consumption plays in human health and nutrition in both developing and developed countries. This increased global awareness has been primarily led by the combined efforts of the Food and Agriculture Organization (FAO) and World Health Organization (WHO) of the United Nations (UN). FAO organized this workshop to build on these efforts with a particular focus on South Pacific island communities, which face an array of health and nutritional challenges associated with inadequate fruit and vegetable consumption.

The importance of horticulture on human health and nutrition was also reflected during the sessions of the 29th International Horticultural Congress (IHC2014) that was held in Brisbane, Australia, in August 2014. The IHC is the world's preeminent congress on horticulture science and, as such, attracts expertise from research through to education and policy, from both developed and developing countries, to exchange ideas.

The Secretariat of the Pacific Community co-hosted IHC2014 –along with the Australian Society of Horticultural Science and the New Zealand Institute of Agricultural and Horticultural Science under the auspices of the International Society for Horticultural Science– providing an ideal opportunity to highlight the region and focus on its unique challenges. The importance of health and nutrition and the consumption of fruit and vegetables were discussed extensively in this wider context.

The workshop in Fiji, comprised of a three-day agenda and a field visit, organized within the framework of the FAO-WHO Joint Initiative on Fruit and Vegetables for Health continued this discussion. It was the first workshop under this crucial Initiative to focus on the South Pacific region. FAO partnered with WHO, SPC, ACIAR, ISHS and the University of Tasmania to organize this workshop. The workshop's six main objectives were to:

1. create awareness about the FAO-WHO Joint Initiative on Fruit and Vegetables for Health;
2. document the production and consumption of fruit and vegetables and their current position in the market in the South Pacific;
3. map existing policies and current programmes and activities for the promotion of fruit and vegetables in the South Pacific;
4. follow up on relevant national level actions set within the Pacific Food Summit Framework of Action for the countries that have laid this out — identifying current challenges and needs to move forward towards realization — and assist those that have yet to develop action plans, drawing on elements of the Kobe framework<sup>1</sup> for promoting fruit and vegetables at national level;
5. strengthen collaboration amongst sectors and actors promoting fruit and vegetable production and consumption in the South Pacific; and
6. highlight critical food safety issues associated with production and consumption of fresh fruits and vegetables.

The workshop's opening technical session included a presentation on the results of a widespread survey of vegetable and fruit production and consumption, and health and nutritional challenges. The remaining programme included case study presentations and open

---

<sup>1</sup> This framework gives guiding principles for a fruit and vegetable programme through a holistic approach. It was developed during the FAO/WHO workshop held in Kobe, Japan in September 2004 — the first joint workshop between health, nutrition and horticulture specialists.



forum discussions with a particular focus on integrated strategies for combating relevant non-communicable diseases, obesity, under nutrition and micro-nutrient deficiency. This workshop built on the Framework of Action on Food Security in the Pacific<sup>2</sup>, which was endorsed by the Pacific Food Summit held in Port Vila, Vanuatu, 21-23 April, 2010 and by Pacific Leaders at their meeting in August 2010. Many of the country-level activities identified through this Summit related to fruit and vegetable consumption. By building on previous and ongoing programmes, this workshop introduced the FAO/WHO framework and provided guidance on the development of national-level initiatives to improve availability and consumption of fruit and vegetables.



<sup>2</sup> [http://www.spc.int/lrd/publications/doc\\_download/1055-towards-a-food-secure-pacific-2011-2015](http://www.spc.int/lrd/publications/doc_download/1055-towards-a-food-secure-pacific-2011-2015)

## 2 Background

It is widely accepted that daily consumption of fruit and vegetables is important for human health and nutrition because the vitamins, minerals, essential micronutrients, fibre, vegetable proteins and biofunctional components they provide are crucial for human bodily function. However, despite this recognition, worldwide per capita consumption of fruit and vegetables is estimated to be 20-50 percent short of the minimum level recommended by FAO and WHO (FAO, 2006). Such a deficit has severe consequences for human health and according to WHO, low fruit and vegetable intake is among the top ten identified risk factors for global human mortality and poor health (FAO, 2004).

The poor health conditions, associated with inadequate consumption of fruit and vegetables and lack of physical activity, favour the development of non-communicable disease (NCD), obesity and micronutrient and vitamin deficiencies. NCDs include cardiovascular diseases, diabetes, cancer and respiratory diseases; they are currently the cause of 6 out of every 10 deaths (FAO, 2006). It is often mistakenly assumed that NCDs are confined largely to the developed nations. The situation is, however, more dire in the developing world where, for example, twice as many deaths are caused by cardiovascular diseases than in developed countries (FAO, 2006).

Low consumption of fruit and vegetables is often simplistically attributed to unhealthy diets in developed countries and to poverty and food insecurity in developing countries. In reality, barriers to adequate fruit and vegetable consumption differ greatly between countries/communities. One region that faces an array of unique challenges is the South Pacific.

Fruit and vegetable intake in Pacific Island Countries and Territories (PICTs) is well below the recommended level of five servings per person per day, or 400 g per day (Secretariat of the Pacific Community, 2010). This, among other risk factors, contributes largely to the high prevalence of NCDs, principally diabetes and cardiovascular disease. A major risk factor for NCDs is obesity, a key concern in this region: over half the people in all of the PICTs are overweight and ten of the most overweight and obese countries on earth are located in the South Pacific (Mercer, 2007). Existing alongside obesity at astonishing rates are, however, under-nutrition and micro-nutrient deficiency. In 2010, more than one fifth of children and pregnant women were recorded as being anaemic in 15 out of 16 PICTs (WHO, 2010).

The geographical isolation of communities in the South Pacific region is a factor that greatly limits access to fruit and vegetables. The region comprises 20 000 to 30 000 islands over the Pacific Ocean belonging to 22 countries and territories. Since the population of the entire region is only 9.7 million (of which 7.6 million live in Papua New Guinea), these countries are characterized by small populations living in remote areas (WHO, 2013). The extreme isolation of the Pacific creates logistical barriers to efficient fruit and vegetable trade and distribution. Low soil fertility is another key concern, particularly in atoll nations.

The Pacific Island region experiences unique environmental challenges, such as extreme weather conditions and rising sea levels, and socio-cultural issues, such as land tenure disputes, that reduce productivity and availability of fruit and vegetables. Unemployment and more sedentary lifestyles create situations where people are both inactive and poor.

Countries in the Pacific region are generally poor, with five of them classified as least-developed countries (UNCTAD, 2012). Economic constraints also exist and include high and fluctuating food and energy prices, poorly developed supply chains and infrastructure, and small national economies.

The situation in the South Pacific region has not gone unnoticed. Local and international initiatives have sought to address the need for increased fruit and vegetable consumption but more must be done.

WHO's Global Strategy on Diet, Physical Activity and Health (2002) has increased worldwide initiatives addressing health and nutritional issues. The Strategy was endorsed in the Pacific Islands in 2006. Other positive influences have been: WHO's "5 A Day" Symposium, held in Christchurch, New Zealand in 2004; the implementation of FAO's Food Security and Sustainable Livelihoods Programme and Regional Program for Food Security; the Australian Center for International Agricultural Research's (ACIAR) Pacific Partnerships and the Pacific Agribusiness Research for Development Initiative (PARDI) Programmes; and the Australian Agency for International Development's (AusAid) Nutrition Project. All have contributed to improve food and nutrition security in the region and to increase fruit and vegetable availability and consumption. In most recently in the 2010 Pacific Food Summit, a framework for action was elaborated that emphasized again the importance of fruit and vegetable consumption for health, as well as the environmental and economic challenges faced for production and access. It has also been discussed and addressed at the Global Forums on Non-communicable Diseases in 2011, 2012 and 2013.

The Global Fruit and Vegetables for Health Initiative (PROFAV), was launched in 2003 in Geneva by FAO and WHO in recognition of the importance of their consumption, as well as underlining the importance of improved production capacity of local small holder farmers. The first workshop took place in Kobe, Japan, in 2004 where a framework that could be applied globally for implementing national level interventions was developed. Consequently, regional "awareness creating workshops" were held respectively in Lisbon (Portugal) for the lusophone countries, in Seoul (Republic of Korea) for East Asian countries, in Yaoundé (Cameroon) for the French speaking countries of Africa, and in Arusha (Tanzania) for the Anglophone countries of Africa. Successful national workshops have since been run in a number of countries including Cape Verde, Ghana and Argentina. This workshop in the Pacific followed the work done on fruit and vegetable consumption for health in the region, identifying challenges the countries are currently facing and sharing lessons learned from other PROFAV regional or national initiatives, working together to move a step forward towards achieving improved health for the population in the region.

## ③ Meeting report, conclusions and recommendations

### >>> 3.1 Introduction

The Pacific Regional Workshop on Promotion of Fruit and Vegetables for Health (PROFAV-Pacific 2014) was held in Nadi, Fiji, from 20-23 October 2014. The workshop was organized at the Tanoa Hotel by FAO with the support of WHO, Secretariat of the Pacific Community (SPC), ACIAR, International Society for Horticultural Science (ISHS) and IHC 2014.

This workshop was organized within the framework of the FAO-WHO Joint Initiative on Fruit and Vegetables for Health. It brought together 27 experts including policymakers, programme managers, scientists and development practitioners, representing the sectors of health, nutrition, horticulture, agriculture and education from nine Island countries of the Pacific region which included: Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Niue, Samoa, Tonga, Tuvalu and Vanuatu (see Annex 2). Representatives from the organizing, supporting and technical partners were also present, including FAO, WHO, SPC, ACIAR and the University of Tasmania, Australia. The meeting was opened by the Permanent Secretary of the Ministry of Agriculture of Fiji, the Host Country.

### >>> 3.2 Workshop process

The FAO/WHO framework was introduced during the plenary sessions and was followed by presentations on specific topics. These included the importance of fruit and vegetables for public health and food safety; the nutritious leafy vegetables research activity in the Pacific; the



Rambutans

© MUHAMMAD MAHDI KARIM



mismatch between consumer-demand, health, and supply of fruit and vegetables; the WHO STEP wise approach to Surveillance (STEPS) methodology on the major health risk factors for Non Communicable Diseases (NCDs); and the challenges and strategies for increasing production and consumption of fruit and vegetables in the Pacific Islands.

Two keynote/Case Studies were presented from Fiji and Samoa. Furthermore, the preliminary analysis of the pre-workshop questionnaire on the status of fruit and vegetable production and consumption in countries of the region was also presented. A field visit to horticultural service installations and a research centre near Nadi was organized as part of the workshop programme.

### >>> 3.3 Conclusions

- According to WHO STEPS surveys on chronic disease risk factors conducted in most Pacific Island countries and in line with existing FAO data, fruit and vegetable (F&V) consumption levels are generally well below the recommended daily intake of 400 g/person. This low consumption of fruit and vegetables is a major risk factor for NCDs, principally diabetes and cardiovascular disease, and also for micronutrient deficiency-related health problems.
- Precise and location-specific data on production, consumption and availability of fruit and vegetables are lacking or weak for many Pacific countries. There is a crisis in the region resulting from the rise of unhealthy food consumption patterns and obesity, considering their links to NCDs. Paradoxically, excess consumption of calories co-exists with under-nutrition, constituting the so-called ‘double burden’ of malnutrition.
- It emerged that national institutions in most countries of the region have established strategies for NCD prevention and have been implementing programmes to advocate for healthy diets and lifestyles with increased consumption of F&V within these strategies.



- Nonetheless, strengthened efforts and greater integration of activities among horticulture, nutrition, health and education stakeholders is considered essential for the effective promotion of F&V for health, particularly through a multistakeholder approach. It is important to strengthen joint efforts between the public and private sectors towards improving production, availability and utilisation of nutritious F&V.
- NGOs, civil society and especially faith-based organisations, can play a key role among stakeholders in increasing awareness and facilitating programmes to improve availability and consumption of F&V, and should be engaged through inclusive consultation mechanisms.
- It was found that island countries of the Pacific generally face challenges in securing adequate year-round supplies of fresh F&V. Factors affecting local production capacity, and F&V availability, include an ageing farming population, land availability and access, land tenure, reliable water supply, access to seeds and planting materials of adapted species and varieties, pest and disease problems, declining soil fertility, transport and high post-harvest losses, and lack of use of guidelines and standards for food and nutrition.
- Specific constraints and challenges for atoll agriculture, often coincide with extreme pressure on limited land and water resources and climate pressure, isolation, and low availability of fresh F&V, were found to justify strengthened efforts on research for more productive and sustainable local F&V cultivation systems.
- More can be done to enable local production, especially at household level, by considering a range of technologies and systems, including agroforestry-based approaches, container gardening and water management technologies (e.g. water harvesting, grey water recycling, relocation of pulaka pits etc.).
- The workshop recognised the importance of stepped-up advocacy, information and community education in changing the mindset of people in order to enhance the appeal of F&V as a healthy diet choice. Different approaches were considered to be useful in this connection, including:
  - mobilising champions and role models;
  - making schools healthier by serving F&V in school meals and canteens;
  - demonstration of garden approaches and cooking demonstrations in multiple social settings;
  - exposing school children to realities of good farming; and
  - educating children about benefits of F&V from an early age as a component of school curricula and school meal programmes.
- School gardens are also considered to be an important entry point for developing healthy diets, incorporating nutritious, local and traditional F&Vs.
- Adopting simple incremental and reachable population goals such as “increasing F&V intake by at least one serving per day in the next 3 years” can help to bring the recommendations of national dietary guidelines down to a level of popular understanding.
- Food safety of F&V produce is very important and must be addressed through integrated approaches from field to table. This would require standards setting, compliance control and training and education so that all stakeholders along the food chain understand how to produce, handle and consume safe F&V.
- Various programmes are being promoted in Pacific island countries on traditional local vegetables as good sources of micronutrients. These are based on local production of adapted carotene-rich vegetables and fruit, such as Orange Sweet Potato (OSP), yellow and red bananas, papaya and leafy vegetables. These initiatives could be scaled up for enabling higher year-round production and consumption of a range of F&V, especially from home, school and village gardens.
- Emphasis needs to be given to encouraging capacity building through farmer training on good agricultural practices (GAP), including integrated pest management (IPM), for sustainability and food safety along the value chain. Useful approaches include farmer field schools, demonstration based training and the use of farmer-to-farmer mentoring.

- Measures such as farm field days, show and diversity days, and produce competitions, can also be useful ways of promoting uptake of improved technology and raising awareness among farmers and consumers on the benefits of F&V production and consumption.
- Better management and reduction of pesticide use is needed through more widespread adoption of IPM practices, supported by effective regulatory processes and knowledge about non-toxic plant protection products and measures. It is also critical to prevent the illegal trade and use of unregistered pesticides in the region.
- There should be greater use of available biodiversity enabled by research, capacity building and local selection and breeding programmes; furthermore, measures to enable the exchange of plant material among countries need to be adopted.
- Further work needs to be carried out to increase knowledge on food preparation and health benefits of local, traditional and indigenous F&Vs.
- It is important to address prejudices against the consumption of vegetables and/or fruit and ensure men, women and children are targeted in F&V promotion campaigns.
- Improved F&V availability and reduced losses should be addressed also through a supply chain approach involving improvement of collection centres, better storage, including traditional methods, and communication along the supply chain making use of information and communication technologies (ICTs).
- Good baseline data to characterise production, supply and consumption of F&V is needed in order to be able to monitor changes and improvements. Equally, data on people's knowledge about benefits and consumption habits should be collected and monitored.
- There are a number of opportunities that can be used to advocate PROFAV messages, for example, the high-level health and agriculture ministerial fora in the Pacific countries, as well as global fora, International Conference on Nutrition etc.
- Countries need to consider means and incentives to reverse the trend of an ageing farming population and to attract and retain youth in agricultural production, by changing the perceived status of agriculture from low-paid hardwork to a technology-oriented and business-driven occupation.
- It is important to integrate with, and add value to, existing agriculture, health and education programmes, especially those focused on NCD prevention and F&V supply chain efficiency improvement.

### >>> 3.4 Recommendations

#### *To participants:*

- To brief their respective ministries, maintain and strengthen communication among sectors to establish a multi-stakeholder country team or identify an existing coordinating mechanism (e.g. NCD committee) that could facilitate implementation of the workshop recommendations.
- To establish a networking mechanism that will enhance the interaction across sectors (horticulture-health-education) in-country and among Pacific island countries on PROFAV, using tools such as an e-newsletter-based communication strategy, improved web-based availability of information, etc.
- To identify a lead person per country to facilitate joint planning and follow up on the implementation of activities and progress monitoring mechanisms that the multi-stakeholder teams identified during the workshop.
- To facilitate the completion of the PROFAV assessment through the questionnaire and its analysis by FAO.

#### *To governments of participating countries*

- To promote the PROFAV agenda within the context of all relevant national policies and strategies, as well as regional and global high level inter-governmental fora.

- Specific policies and resolutions made at this level will increase awareness among the international community and development partners and assist countries to adopt effective elements of the PROFAV initiative.
- To implement the Global Strategy on Diet, Physical Activity and Health (endorsed during the Fifty-seventh World Health Assembly [WHA57.17]) which states that national food and agricultural policies should be consistent with the protection and promotion of public health and to promote better diets along with increased physical activity.
- To build and strengthen human resources and institutional capacities that will be required to reach the goals of the PROFAV framework. This could also be a potential area for development assistance.
- To utilise surveillance and monitoring systems in the development of strategies, plans and programmes on F&V and in the evaluation and impact assessment of such programmes.

*To development partners*

- To support the planning and implementation of national and regional horticulture, education and health policies, and the PROFAV framework.
- To facilitate information sharing at operational level among countries, enhance availability of existing, relevant information and resource materials, and support member countries in the development of networking mechanisms.

*To NGOs, Private Sector and Civil Society Organizations*

- To join and support the PROFAV initiative and become active stakeholders in the definition and implementation of its agenda.

*To sponsor and partner PROFAV organisations*

- FAO Headquarter, regional and country offices, SPC and ACIAR to work together in providing support to countries in increasing F&V consumption and promote the PROFAV initiative while encouraging countries to implement it.
- To encourage new development partners to join and support countries in the implementation of the PROFAV agenda.
- To bring the countries and stakeholders that were unable to participate in the Nadi workshop up to date and engage them in the follow up process.

Agreed on 23 October 2014, Nadi, Fiji Islands.





Noni fruit (*Morinda citrifolia*)





## 4 Presentations

### >>> 4.1 Promoting health through horticulture

*Alison Hodder, Senior Horticultural Officer FAO, Plant Production and Protection Division, Rome, Italy*

Fruit and vegetables are excellent sources of essential vitamins and minerals (A, folate, C, E and potassium), fibre and vegetable protein. It has been estimated recently that 14.9 million pre-school age children and 21 percent of pregnant women in developing countries of the Western Pacific are affected by vitamin A deficiency.

Fruit and vegetable intake in PICTs is well below the FAO-WHO recommended level of five servings or 400 g/person/day. In PICTs, there is a high prevalence of NCDs; significant incidence of obesity; and high incidence of under-nutrition and micro-nutrient deficiency co-existing with obesity.

It is important to beware of generalisation in data interpretation. Figures that map fruit and vegetable supply and availability at national level are at best vague and at worst unreliable. The data at a local level is usually unavailable and much of the production and consumption is effectively invisible. There is a need to fill these gaps and to keep in mind that supply does not equal consumption. In order to address the gap in supply and consumption, it is essential to understand the current consumption patterns and causal / motivational factors is essential in any national campaign pro fruit and vegetables; allow for different attitudes/perceptions (fruit vis-à-vis vegetable consumption); and address supply and demand deficits simultaneously and through coordinated campaigns.

The challenge is to get F&V supply and demand growing in balance. This implies effectively reversing the per capita supply/consumption trends; optimizing the supply chain; keeping costs low and prices affordable; assuring the safety; applying a supply chain approach (from farm-to-table); and tightening linkages to nutrition education and public health promotion

These goals, reflected in the FAO/WHO dietary guidelines, appear to have the general agreement of the international health community. This is key when leveraging partnerships because an over-arching framework is needed to facilitate working linkages and value-adding around these very different areas of activity; linkages, partnerships, strategic alliances, platforms are necessary to ensure an integrated approach to policy, strategy and technology development; and public-private partnerships should be fostered.

FAO and WHO's PROFAV initiative fosters capacity building and policy development initiatives. It works toward building more resilient production systems and value chains for year-round availability and access to F&V; promoting Good Agricultural Practices for safe, quality F&V; adopting National strategic plans for the sustainable development of small scale and intensive horticulture; building active, independent producer associations to enhance farmers' role in R&D decision making; and providing support to create and use information/decision support tools (e.g Hortivar). The two main pillars of PROFAV are:

- Promoting production and consumption of F&V for improving health, helping to prevent chronic diseases and nutritional deficiencies;
- Promoting the advancement of science and know-how in production, distribution, consumption, and health benefits of fruit and vegetables.

Under PROFAV initiative, the Kobe framework was developed. This framework was adopted in Kobe, Japan in 2004. It aims to promote and support the fruit and vegetable sector from field to table, capitalising on programmes and projects that are already underway. The strategy it adopts aims to:

- build multi-sector consultation mechanism for F&V promotion: Agriculture-Health-Education + private sector + civil society;
- track F&V supply and consumption, baseline for M&E and identification of groups at risk; and
- design integrated programmes, build on on-going initiatives in horticulture, nutrition, public health.

Some of the practices that are being applied to improve the demand and consumption for F&V include:

- National Dietary Guidelines
- F&V in school meal programmes
- 5-a-day campaigns
- Promotion of home and community gardens
- Promotion of school gardens and nutrition education: children are current and future consumers.

The Pacific region has been an early starter. Many initiatives are happening across the region, thus making it possible to take stock of the current situation. This workshop provides the opportunity to:

- map current policies, programmes and activities for promotion of fruit and vegetables in each country;
- document production and the consumption of fruit and vegetables and their current position in the market;
- build concrete action plans for implementing the FAO - WHO framework for the promotion of F&V at country level;
- strengthen joint work amongst health, education and agriculture sectors for promoting F&V production and consumption; and
- highlight critical food safety issues associated with production and consumption of fresh fruits and vegetables.

## >>> 4.2 Importance of fruit and vegetables for public health and food safety

*Peter Sousa Hoeksken, Technical Officer – Food safety & NCD, WHO Division of Pacific Technical Support DPS, Suva, Fiji*

The Pacific is currently facing a noncommunicable disease (NCD) crisis. Once, traditional/ local crops dominated the population's diet; now, they have to a large extent been substituted by processed foods.

The primary indicators of an unhealthy diet are:

- Oversupply of calories (kilojoules)- too much food, leading to high total energy intakes;
- Imbalance in macronutrients - too much fat and/or sugar and insufficient dietary fibre;
- Excessive intake of salt;
- Low intake of micronutrient and of fresh fruit and vegetables.

It is important to focus on fruit and vegetables because low fruit and vegetable intake is among the top 10 risk factors for attributable mortality. Globally, about 2.7 million deaths could be saved with adequate fruit and vegetable consumption; and fruit and vegetable consumption helps reduce the risk of NCDs.

The adequate intake of fruit and vegetables as part of the daily diet helps prevent cardiovascular disease and certain types of cancer. Fruit and vegetables are also associated with reduced risk of obesity and diabetes. Micronutrient deficiencies can cause birth defects and weaken the immune system. The recommended daily intake of fruit and vegetables is 400 grams, or five servings.



TABLE 1  
**Who eats less than 5 servings per day in the Pacific (in percent)**

Country	Male	Female
Vanuatu	58.2	65
Fiji	83.9	86.2
Tonga	92.3	93.2
Kiribati	99.4	99.6
Samoa	38.6	36.8
Cook Islands	83.5	79.9
Niue	94	91.9
Tuvalu	n.a.	n.a.
Marshall Islands	91.9	90.1
Palau	n.a.	n.a.

The challenges for increasing consumption are supply chain issues, convenience, social and cultural issues, price structure and lack of awareness of health benefits. Food safety issues associated with fruit and vegetables include biological, chemical and physical elements. Food safety is important especially when consuming fresh and unprocessed products. There are risks associated with food borne diseases. Pathogenic microorganisms can cause infections and intoxications. Chemical hazards are also of concern since chemicals can be added or can be naturally present. Thus, ensuring food quality and safety is a shared responsibility – producers and farmers, government, and consumers.

In conclusion, fruit and vegetables play an important role in the prevention of NCDs; the intake of fruit and vegetables in the Pacific is low; measures need to be put in place to promote local production and increased consumption of fruit and vegetables; and food safety assurance is key for expanding production and consumption.



### >>> 4.3 Promoting nutritious leafy vegetables in the Pacific and Northern Australia

G.H. Lyons, University of Adelaide, Waite Campus, Glen Osmond, Australia

R.G. Goebel, Etty Bay Exotics, Mourilyan, Australia

P. Tikai, World Vegetable Center (AVRDC), Honiara, Solomon Islands

K-J. Stanley, Women in Business Devt. Inc., Apia, Western Samoa

M. Taylor, University of the Sunshine Coast, Maroochydore, Australia

A more traditional lifestyle, especially with respect to diet and exercise, is needed to address the alarming rates of obesity, heart disease and diabetes in Pacific Island countries and indigenous communities in northern Australia. Leafy vegetables should play an important role but are often regarded as “low status” foods and have received little research attention.

This study found that, although certain leafy vegetables are popular in some countries, particularly Solomon Islands and Tonga, there is little knowledge of their health benefits. Leaf samples were collected in Solomon Islands, Samoa, Tonga, Kiribati, North Queensland and the Torres Strait Islands and minerals, carotenoids and polyphenols were analysed. To study genotype-environment interaction, different species growing at the same location (same soil) and common species growing at multiple locations (different soils) were included in the survey.

The data, together with flavour and popularity, were used to make a “Top 12” nutritious leafy vegetable factsheet series, which was distributed in participating countries and published online ([www.aciar.gov.au/News2013July](http://www.aciar.gov.au/News2013July)). Outstanding species included *Abelmoschus manihot* (aibika, bele), *Polyscias* spp. (ete), *Sauropus androgynus* (sweetleaf), *Moringa oleifera* (drumstick tree) and *Basella alba* (creeping spinach).

Aibika was high in iron, zinc, magnesium, manganese, protein and lutein; sweetleaf was high in iron, zinc, calcium, magnesium, manganese, sulphur, lutein, b-carotene and protein; ete was high in zinc and calcium and grows well on alkaline coral soils; drumstick was high in b-carotene, sulphur and selenium, and creeping spinach was high in magnesium and polyphenols.

Reliable provision of quality germplasm, more nutrition education, including school food gardens which feature the most nutritious vegetables, and value chain research to improve shelf-life and delivery of nutrients to consumers are recommended.



© G.H. LYONS



© G.H. LYONS



© G.H. LYONS

#### >>> 4.4 A case study: The mismatch between consumer-demand, health, and supply of fruit and vegetables in Tasmania (Australia) and in Papua New Guinea

*Alistair Gracie, Tasmanian Institute of Agriculture, School of Land and Food, University of Tasmania, Tasmania, Australia*

*Mark Boersma, Tasmanian Institute of Agriculture, School of Land and Food, University of Tasmania Tasmania, Australia*

The fundamental and vital role that fruit and vegetable consumption plays in human health and nutrition is well established. In Australia, national initiatives to change consumer behaviour to increase the proportion of fruit and vegetables consumed in diets, such as the “Go For 2&5”, have experienced limited or only regional success. While the Australian population still consumes less than the recommended level of fruit and vegetables this is generally not due to production nor supply limitations.

This is the case in Tasmania, where a nexus of social, economic and cultural driver have resulted in per capita reductions in fruit and vegetable consumption over the last decade (Tasmanian Government, 2013). Social, economic and cultural impediments to fruit and vegetable consumption are discussed in the context of government, non-government, and producer-based initiatives to promote consumption of fruit and vegetables.

TABLE 1  
Adequate fruit consumption by sex, 18 years and over, Tasmania 2009 and 2013

Adequate fruit*	2009		2013		Significant
	%	95% CI	%	95% CI	
Males	42.9	[40.4, 45.3]	36.8	[33.9, 39.7]	Y
Females	56.4	[54.4, 58.4]	51.5	[49.2, 53.8]	Y
Total population	49.8	[48.2, 51.4]	44.2	<b>[42.4, 46.1]</b>	Y

\* 2 serves daily: Tasmanian Population Health Surveys 2013

TABLE 2  
Adequate fruit consumption by sex, 18 years and over, Tasmania 2013

Adequate fruit*	2009		2013		Significant
	%	95% CI	%	95% CI	
Males	7.0	[5.9, 8.2]	5.9	[4.8, 7.2]	N
Females	14.7	[13.4, 16.1]	13.5	[12.1, 15.1]	N
Total population	10.9	[10.1, 11.9]	9.8	[8.8, 10.8]	N

\* 5 serves daily: Tasmanian Population Health Surveys 2013

In contrast to Australia, most of Papua New Guinea’s population (87 percent) live in rural areas, and approximately in 1 in 6 people live in severe poverty. Households in PNG historically produce the majority of the food consumed, and while this provides much of the dietary requirement for carbohydrates through starchy root crops, malnutrition is widespread and prevalent as their diets are generally deficient in proteins, fats, vitamins and minerals (Bourke & Harwood, 2009). Non communicable diseases are widespread and, alarmingly, nearly one third of the children under the age of 5 years in PNG are stunted due to malnutrition (WHO, 2011). Addressing the malnutrition challenges of PNG, a country that is geographically and culturally diverse with low literacy rates, is complex and requires an holistic approach that considers the local, cultural values, economic status and education and social elements.

## >>> 4.5 Improving the nutritional status of the population in Fiji

*Ateca Kama, National Food and Nutrition Centre, Ministry of Health, Suva, Fiji*

Fiji is beset with serious but preventable nutrition-related diseases caused by diabetes, coronary heart diseases, high blood pressure, anaemia and under-nutrition in children. These preventable conditions burden the economy with excessive medical cost both in relative and absolute dollar terms and a significant loss of human development potential and work productivity.

Research in Fiji has clearly shown that a major cause of all prevalent non-communicable diseases in particular childhood obesity and nutrient deficiency diseases has been the change to poorer quality diet and lifestyle as a result of development and modernization.

Findings from the 1993 and 2004 NNS showed the problems of infant malnutrition, underweight children, anaemia and overweight in many adults leading to heart diseases and diabetes appear to be worsening. For example, more than 60 percent of the total population were found to be of unhealthy weight; either overweight, obese or underweight.

Overweight and obesity in 1993 was 33 percent but the 2004 NNS found the rate was 56 percent; overweight in children tripled in 2004 compared to the 1993 NNS. Overweight is a major risk factor for coronary heart disease and type 2 diabetes, and its association with both diet and lifestyle.

Anaemia rates among the population increased to 32 percent in 2004 from 27 percent in 1993. Forty percent (40 percent) children under 5 years were anaemic in 1993 but the proportion had increased to 50 percent in the 2004 NNS.

Results of the 1993 and 2004 National Nutrition Surveys indicate a shift in preference from nutritious traditional vegetables and fruits to more introduced and imported varieties.

Food Balance Sheet data spanning the period 1992-2009 on major sources of calories from the available food supply clearly showed that cereals are replacing root crops as a source of energy. Available information indicates a downward trend in the production of traditional food crops for local consumption and a subsequent increase in the consumption of cereals such as flour, flour products and rice.

The total calories available per capita per day from the food supply have increased from 2 819 in 1985 to 3 421 in 2009. Calories from imported foods in the last decade increased from 55 percent in 1999 to 68 percent in 2009. The major increase in 2009 was attributed to a high importation of cereals, dairy and vegetable fat and oil.

Government's recognition of the importance of nutrition in development, and the need for intersectoral action to improve the food and nutrition situation of the country, led to the endorsement of the Fiji Food and Nutrition Policy 2008 and Fiji Plan of Action for Nutrition 2010-2014 by Government.

The Fiji Plan of Action 2010-2014 will be evaluated through the National Nutrition Survey 2014. The timing is a perfect fit with the need to assess the effect of the nutrition intervention strategies contained in FPAN. The proposed study will determine whether the strategies have had impact on the nutritional health of Fiji's population. The survey findings will be used to inform future evidence informed policies, surveillance and nutrition interventions.



## >>> 4.6 Survey report: Barriers to the promotion of fruit and vegetable production and consumption

*Minwook Kim, Agricultural Officer, FAO, Plant Production and Protection Division, Rome, Italy*

The purpose of this survey was to assess the barriers to the promotion of fruit and vegetables production and consumption in the Pacific Region and to introduce a framework for promoting fruit and vegetables at national level. Eight countries in the Pacific region – Cook Islands, Fiji, Kiribati, Marshall Islands, Niue, Samoa, Tonga and Vanuatu – participated in this survey.

Among these countries, Kiribati, Marshall Islands, Samoa and Tonga have national platforms that participate in various sectors for promoting fruit and vegetable production, supply and consumption, except in the area of consumers' association.

Most countries have divided their agricultural and nutrition/health goals into short and long terms. However, the goals do not appear to be strictly related to fruit and vegetable promotion because they are too general (i.e. food security).

The most general barrier to the promotion of F&Vs is related to economic issues – price, income, land accessibility, labour resources etc. Other barriers included the lack of horticultural technology and climate constraints, such as drought or excessive rains. Three countries ranked climate constraints as their major general barrier.

According to consumer demands, lack of seeds and varieties is the major barrier affecting rural smallholders, followed by human resources and limited knowledge. For mixed consumers, land and income barriers are of concern, as well as the lack of technology. For market-dependent consumers, the high prices of F&Vs are a major barrier.

Just two countries, Niue and Marshall Islands, have a horticulture development plan. Various campaigns for promoting consumption of F&Vs have been undertaken by their governments and NGOs, even though they need to be more proactive. Also, school gardens are very common in the region.

Despite the fact that most of these countries do not have their own national food composition tables or food-based dietary guidelines, some countries are using a dietary guideline developed by the Secretariat of the Pacific community Health and Nutrition Division or FAO's Food Balance Sheets.

This result provides a partial picture of the situation, because this is solely based on the responses of some countries. After the Pacific workshop, results could be modified following participants' response modification, and further statistical surveys should be carried out with the cooperation of participants (see Annex 2).

Litchi chinensis



© LUC VIATOUR

## >>> 4.7 Increasing production of fruit and vegetables in the Pacific Islands: Challenges and strategies

*Siosina Halavatau, Deputy Director (Food and Nutrition Security Program), SPC Land Resources Division, Suva, Fiji*

Currently, a low fruit and vegetable consumption prevails in the Pacific Islands. For example, in Tonga, nuts, fruit, preserved fruit and juice imports in 2009 amounted to 765.2 tons (worth \$2 582 677). The domestic supply of fruits in Tongatapu from Talamahu market and roadside markets was 1 055 tons in 2010 and 1 333 tons in 2011, while 498 tons of vegetables in 2011. The 2009 Household Income and Expenditure Survey revealed that only 5.8 percent of average monthly expenditure is spend on buying fruits compared to 27.8 percent spent on meat and 23% on root crops and vegetable.

The challenges of getting fruits and vegetables to the plates include tradition – diets of Tongans and Samoans did not include vegetables, but it did include some fruits; availability – much of what is promoted are the “cool” seasonal fruits and vegetables - local production is a problem; accessibility – Samoans and Tonga live in towns and farms are on the hinterland. – costs; not bothered attitude; taste; lack of understanding – why they should eat; and preparation.

Although, Pacific smallholders are expert horticulturists for food security and commercial horticulture, the horticultural sector is facing ecological, economic and sustainability crisis. There are pests and diseases outbreak, and there is a decline in soil health and fertility. A hostile climate is a challenging factor. The average temperature and rainfall suggest a benign environment but hide temporal and spatial extremes; alternating cycle of El Nino and La Nina; extreme weather events appear to be more frequent and more severe; and traditionally Pacific Islanders are coping with these extreme weather events by having more resilient reserve crops like swamp taro, *D. nummularia*, *D. Bulbifera* and *Amorphophalus paeoniifolius*.

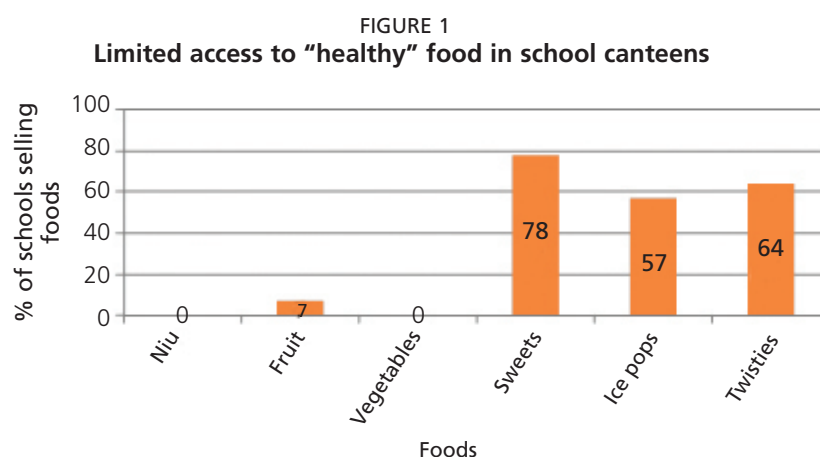
The human factor also has an impact. There is a shortage of skills and information support systems for horticultural research and development; a lack of entrepreneurs ready to take up the opportunities offered by commercial Horticulture; a shortage of people with appropriate formal skills and education to offer technical support; and traditional social system of land tenure and community obligations – shifting cultivation systems - traditional horticulturists are not accustomed to managing soil borne pests and diseases and declining soil fertility hence abandon land to fallow.

The Secretariat of the Pacific Community (SPC) aims to provide more reliably productive crop cultivars that are resistant to locally prevalent pests and diseases and adapted to Pacific climates. CePaCT are traditionally vegetatively propagated crops that support the Go Local initiative. SPC partners with USAID and ACIAR. It is developing tools and guidelines to support schools in developing healthy school guidelines which will have a strong emphasis in promoting local F&V intake. It is necessary to make a special effort to understand local social and economic constraints, and time to introduce new knowledge and to change attitudes.

## >>> 4.8 Food Security in Samoa

*Seve Sinei Fili, Ministry of Health, Samoa*

Between 1963 and 2003, there have been significant changes in the supply pattern. Imported cereals (mainly wheat and rice) have replaced locally produced root crops as the most important source of energy. Furthermore, locally produced meat has been replaced by imported meat. Food insecurity is an issue in Samoa. There is insufficient access to nutritious food. There is limited access to “healthy” food in school canteens, and access to imported fruit and vegetables are restricted due to high tariff rates. Most fruit and vegetables have a 20 percent tariff, while instant noodles, mutton flaps, sugar and salt are not applied a tariff. Advertising influences food choices (reduces selection of healthy foods). Over 70 percent of total food advertisements are aimed at children, and the majority of these are of “unhealthy” foods.



Diets have been shifting; there has been a change in consumption between 1991 – 2003. There has been an increase in the consumption of rice, pancakes, cakes and chips; while there has been a rapid decrease in the consumption of fish and papaya. There is a low fruit & vegetable consumption, and the dietary habits of children are of great concern. In 2003, children consumed more processed foods and fewer fresh fruit and vegetables when compared to adults. In 2006, school children’s most common weekday foods included bread, doughnuts, cabin biscuits, ice pops and instant noodles.

The current efforts to promote local fresh food include:

- Implement food & nutrition policy (Food & Nutrition Policy 2013);
- Implement and monitor healthy diet guidelines, e.g. Healthy Eating and Lifestyle Guidelines for Samoa 2008;
- Promote fresh local foods e.g. fruit and vegetables, starchy root crops, e.g. TV and Radio Spots and Ads;
- Improve food in schools and pre-schools, e.g. Samoa School Nutrition Standards 2012 (SPAGHL support).

Efforts to improve nutritional content of processed foods include:

- Update the food law to allow a focus on healthy food;
- Establish food standards to improve nutrition e.g. control fat, salt and sugar content of food & fortify food;
- Work with business community to increase importation and sale of fortified foods.

Other efforts to improve food security and safety include:

- Develop standards for food labeling
- Incorporate food and nutrition in primary school curriculum
- Develop BHSC at the NUS (including nutrition)
- Conduct research on nutrition e.g. DHS, Brown University

Future possibilities are:

- Excise tax - increase on soft drinks and apply to other “unhealthy” foods
- Develop Code of marketing for children’s food advertising
- Review price control measures and place emphasis on “healthy foods”
- Remove import taxes for fruit & vegetables

In conclusion, Samoan diet has become more modern (increasing reliance on processed foods, especially for children); the health consequences of concern are the increasing rates of lifestyle diseases and micronutrient deficiencies; it is necessary to strengthen what we are doing - educating consumers and promoting physical activity, strengthen sustainable production and use of fresh local foods, and use innovative approaches related to food standards and their effective enforcement; Ministries need to work closely together to improve nutrition, food production and food quality with a multi-sectoral approach; and Samoa needs to work in a harmonised manner with other Pacific countries.



*Psophocarpus tetragonolobus*  
(winged bean)



## 5 Kobe framework for promoting fruit and vegetables at national level

This framework was elaborated and endorsed unanimously by the participants of the WHO/FAO workshop on fruit and vegetables for health, held at the WHO Centre for Health Development, Kobe, Japan, in September 2004.

The framework will guide the development of cost-efficient and effective interventions for the promotion of adequate consumption of fruit and vegetables at the national or sub-national level. In this process, national or local production capacities, traditional agricultural and dietary practices, prevailing patterns of nutrition, the health status of the population, and existing fruit and vegetable promotion programmes need to be taken into consideration. This framework includes general principles and examples of possible interventions for various consumer domains, in order to appropriately tailor fruit and vegetable promotion programmes to the target group(s).

### >>> 5.1 Guiding principles for a fruit and vegetable programme

Globally the right to nutritious food and the will to end hunger and ensure food security has been affirmed on several occasions. Article 25 (1) of the Universal Declaration of Human Rights, adopted and proclaimed by the UN General Assembly in December 1948, states: Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food [...]

In 1992, Ministers and the Plenipotentiaries present at the International Conference on Nutrition, declared: We recognize that access to nutritionally adequate and safe food is a right of each individual (FAO, 1992).

The World Food Summit Plan of Action of 1996 refers particularly to the production of fruit and vegetables under paragraph 21, objective 2.3 (c) by calling on governments, in partnership with all actors in civil society, to encourage, where appropriate, the production and use of culturally appropriate, traditional and underutilized food crops, including grains, oilseeds, pulses, root crops, fruits and vegetables, promoting home and, where appropriate, school gardens and urban agriculture, using sustainable technologies [...] (FAO, 1996).

Five years later, in 2002, the Declaration of the World Food Summit reaffirmed “the right of everyone to have access to safe and nutritious food”. It emphasizes in paragraph 14 the need for nutritionally adequate and safe food and highlight the need for attention to nutritional issues as an integral part of addressing food security (FAO, 2002).

Fruit and vegetable promotion goes also hand in hand with Target 2 of the Millennium Development Goals, which states: Halve, between 1990 and 2015, the proportion of people who suffer from hunger (United Nations, 2014).

The general principles of a national project to promote fruit and vegetables may include:

- availability
- accessibility
- affordability
- acceptability (quality, taste, safety, type of food, cultural sensitivity)
- equity (including underprivileged)
- holistic or integrative approach
- sustainability
- marketing/creating awareness of fruit and vegetables in foods and food programmes.

The establishment of a set of more specific guiding principles for a national fruit and vegetable promotion programme may be shaped by the following general principles:

- A coordinated fruit and vegetable promotion programme should include initiatives which target both demand and supply-side issues and should be based on a needs assessment.
- A fruit and vegetable promotion programme should be coherent with, and complementary to, national policies and action plans such as food and nutrition, health, agriculture, and environmental policies, if existing.
- A programme should attempt to mobilize existing resources (people, information, initiatives, policies).
- A fruit and vegetable promotion programme should be socially inclusive and participatory. From the beginning it should target all social classes through specific actions, and particularly the poor.
- Messages should be consistent across policies and programmes. Every policy or intervention should promote a healthy diet including increased fruit and vegetable intake (e.g. school meal programmes or welfare food programmes should promote increasing fruit and vegetable consumption as part of their provision).
- The main outcome should be increased consumption of fruit and vegetables by the target group(s);
- An interdisciplinary, integrated, holistic approach should be followed in all parts of the programme;
- The process and all interventions should be evaluated;
- Best practices should prevail.

## >>> 5.2 Consumer domains and fruit and vegetable supply networks

An important issue in the design of intervention strategies is the fact that different types of consumers (i.e. socioeconomic groups) acquire and utilize fruit and vegetables in different ways, and there are different types of producers and suppliers. In order to design sound interventions to improve fruit and vegetable intake, it is essential that the under-consuming population groups are identified and efforts made to understand their consumption behaviours.

All consumer domains differ widely within and between countries. The characteristics outlined below are not meant to be exhaustive, but to provide examples which may guide characterization of consumer and supplier domains in specific countries and areas.

### 5.2.1 CHARACTERISTICS OF CONSUMER DOMAINS AND FRUIT AND VEGETABLE SUPPLY NETWORKS

Fruit and vegetables are acquired in varying amounts and from various supply sources, ranging from home production, through purchase in local, rural markets to supermarkets in urban centres. Some consumers – they may be classified as autoconsumers – produce their own fruit and vegetables.



Those who are totally dependent on markets to procure fruit and vegetables may be termed market-dependent consumers and may be further divided into two distinct groups; those who acquire fruit and vegetables for the needs of the household, and those for whom fruits and vegetables are purchased and prepared by others, e.g. feeding programmes.

The latter category, loosely defined as institutional consumers, also includes consumers of school and hospital meals, military and worksite catering, hotel and restaurant catering, etc. Those consumers that both produce and purchase fruit and vegetables may be classified as mixed consumers.

Similarly, different types of suppliers produce and market fruit and vegetables in different ways and through different channels.

Smallholder subsistence farmers produce for themselves and possibly for a local market, while small-scale commercial producers and large commercial firms produce mainly for markets both near and far.

Specific characteristics of the consumer domains mentioned above are expanded below.

### **Rural smallholders producing fruit and vegetables for own consumption and market supply**

Characteristics:

- own production of fruit and vegetables;
- collection of fruit and vegetables;
- exchange of fruit and vegetables for other goods, including gifts;
- often task division between men and women; men produce cash crops, women produce fruit and vegetables for own consumption around the house or in a small garden;
- vegetables consumed are more often home-grown; fruits, if consumed, more often purchased.

The role of smallholders in the market is usually limited to selling very small quantities of surpluses generated in local informal markets (in towns, along roadsides, etc.) that are within an easily-reached distance. Selling may be direct, or through collectors (more common in the case of fruits, spices).



**Annona muricata**

© DAVID EICKHOFF



### Mixed consumers – rural and particularly urban gardeners, but also dependent on market supply

Characteristics:

- occasional fruit and vegetable producers, but their major income is non-agricultural;
- often belonging to low- to mid-income levels;
- may have limited knowledge of the nutritional value of fruits and vegetables and/or a cultural bias against certain fruit and vegetables;
- commonly purchase fruit and vegetables from local markets or small shops;
- fruit and vegetables which they grow are limited in range and amount.

The local markets or small shops that typically supply mixed consumers are often small operators outside the organized formal supply networks. They may comprise urban/peri-urban growers selling their produce (which may include traditional and indigenous types in some countries) direct in informal street markets, small-mixed grocery shops or stands selling a limited range of seasonal vegetables and fruit acquired from wholesalers or producers.

### Market-dependent consumers

Characteristics:

- dependent on cash economy, most of them living in urban or periurban areas thus they have a limited ability to grow food;
- many women in this group work outside the home; hence there is less time available for food preparation and a greater need for convenience and processed foods;
- part of food consumption is outside the home, less cooking takes place in the household;
- poor consumers in this group often purchase in small amounts because of a lack of cash; hence are not able to benefit from supermarkets offering bulk purchases to reduce costs, resulting in higher food costs;



- many do not have access to conditional transfers (transfers of resources to poor families on condition that they engage in some behaviour, e.g. sending children to school, taking children to health clinics), social safety nets or food aid programmes.

The supply network corresponding to this consumer domain is that typical of urban and peri-urban areas, i.e. more or less specialized growers in rural or peri-urban areas with a source of water, selling to collectors, processors, retailers either direct or through assembly or wholesale markets, or sometimes direct to consumers through farmers' markets.

The wholesale/retail chain, especially where supermarkets and specialized greengrocers are involved, may be characterized by cold chains and transport of produce over distances, depending on the country and region concerned.

Import–export of exotic and out-of-season commodities is a feature of the fruit and vegetable supply chains in many countries. At the retail end of the supply chain there may be a range of formal, well-organized operations, such as wet-markets, supermarkets, small greengrocer shops, small-scale informal street and roadside stalls, and itinerant sellers.

Processed, semi-processed and pre-packaged fruit and vegetables can form a very significant proportion of this kind of supply network, as can street food. Where there are formal market supply chains, they may be subject to financial, fiscal, food safety and health regulations.

### Institutional consumers

Characteristics:

- Schools – here the consumers are children and youth. Fruit and vegetables are acquired through school meal programmes/government provisions, private companies, brought from home or purchased at school.
- Worksites – here the consumers are usually healthy adults. Fruit and vegetables are usually brought from home, bought on site (at cafeteria, vending machines, pre-paid programmes), or bought outside e.g. fast foods/restaurant foods.
- Hospitals and care facilities, including child care and care of the elderly – here the consumers are usually persons who are unwell or at high risk e.g. orphans/elderly. Fruit and vegetables are provided as part of institutional meals.
- Military – here the consumers are usually healthy, young adults. Fruit and vegetables are provided as part of set meals.
- Prisons – here the consumers may be at risk of malnutrition. Fruit and vegetables are provided as part of institutional meals.
- Feeding programmes – here the consumers are at risk of malnutrition. Fruit and vegetables are provided, in kind or through purchase vouchers, as part of the programme.

The supply network corresponding to this consumer domain is similar to that of market-dependent consumers, although direct purchasing of fruits and vegetables from producers or wholesalers may be more frequent especially where institutional use is large-scale, regular and long-established.

#### 5.2.2 ENTRY POINTS FOR FRUIT AND VEGETABLE PROMOTION PROGRAMMES

This section outlines, according to the consumer domains established above, possible entry points where fruit and vegetable promotion programmes could be initiated at country level.

## **Rural smallholders producing fruit and vegetables for own consumption and market supply**

Entry points:

- Water – ensuring sustainable supply for plant growth.
- Eating preferences – promoting those fruit and vegetables that are known locally and widely accepted.
- Women – empower women through:
  - freeing time from other tasks to allow fruit and vegetable production and preparation
  - providing financial support for fruit and vegetable production - education about health benefits, and - inclusion of small-scale year-round fruit and vegetable production into extension work.
- Schoolchildren – teaching children in rural areas to grow, prepare and consume vegetables.
- Local markets – providing education on production techniques/crop diversification, food safety and health benefits.
- Encouraging use of simple technologies for production, postharvest handling and conservation.

## **Mixed consumers – rural and urban gardeners, but also dependent on market supply**

Entry points:

- Own production and/or trade with neighbours – providing education on production techniques/crop diversification, food safety and health benefits.
- Local markets – improving infrastructure of market; providing education on production techniques/crop diversification, food safety and health benefits for consumers; methods to improve post-harvest handling.
- Supermarkets/retailers – providing education on health benefits for consumers.
- Small-scale trade – providing education on marketing, food safety, health benefits for consumers.

## **Market-dependent consumers**

Entry points:

- Own production (where possible) – promoting fruit and vegetable growing e.g. in small gardens (micro-growing).
- Local/urban (farmers’) markets – providing education on health benefits for consumers.
- Commercial suppliers, retailers/supermarkets – providing education on health benefits for consumers.

## **Institutional consumers**

Entry points:

Schools:

- Educating and instructing of parents through curriculum and parent–teacher associations.
- Identifying food items to be included and excluded from school environment, e.g. in lunch (provided from home), changing choices in vending machines, specifying percentage of fruit and vegetables to be included in school lunch programmes.
- Educating children and creating awareness about fruit and vegetables and what constitutes a healthy diet e.g. through comics (example from Brazilian programme), posters and visible reminders in classrooms.



- Building children’s food skills, e.g. how to select fruit and vegetables, how to prepare foods.
- Producing, and teaching about, fruit and vegetables via school gardening programmes.
- Encouraging a clean environment; encouraging washing of food and proper hand-washing.
- Reviewing curricula e.g. including nutrition in science classes, home economics.

Worksites—for both large and small companies:

- Ensuring that fruits and vegetables are available, whether foods are bought or brought from home.
- Providing minimum kitchen facilities for preparation of foods e.g. microwave or heating implement, sink for washing, refrigeration.
- Changing choices available in vending machines, fruits, vegetables, dried, canned, fresh, unsweetened 100 percent juices.
- Encouraging fruits and vegetables in cafeteria programmes.
- Organizing worksite programmes to increase nutritional awareness of workers; increasing education of management that nutrition is important for healthy workers and productivity.
- Ensuring a clean environment.
- Providing reminders such as posters, educational materials, audio programmes, seminars, recipes for healthy foods.
- Asking nearby restaurants to display healthy-diet posters and nutritional information for available foods.
- Enforcing labelling of foods purchasable at the worksite.

These recommended entry points are also generally applicable to other institutional consumers such as hospitals, prisons, armies, etc.



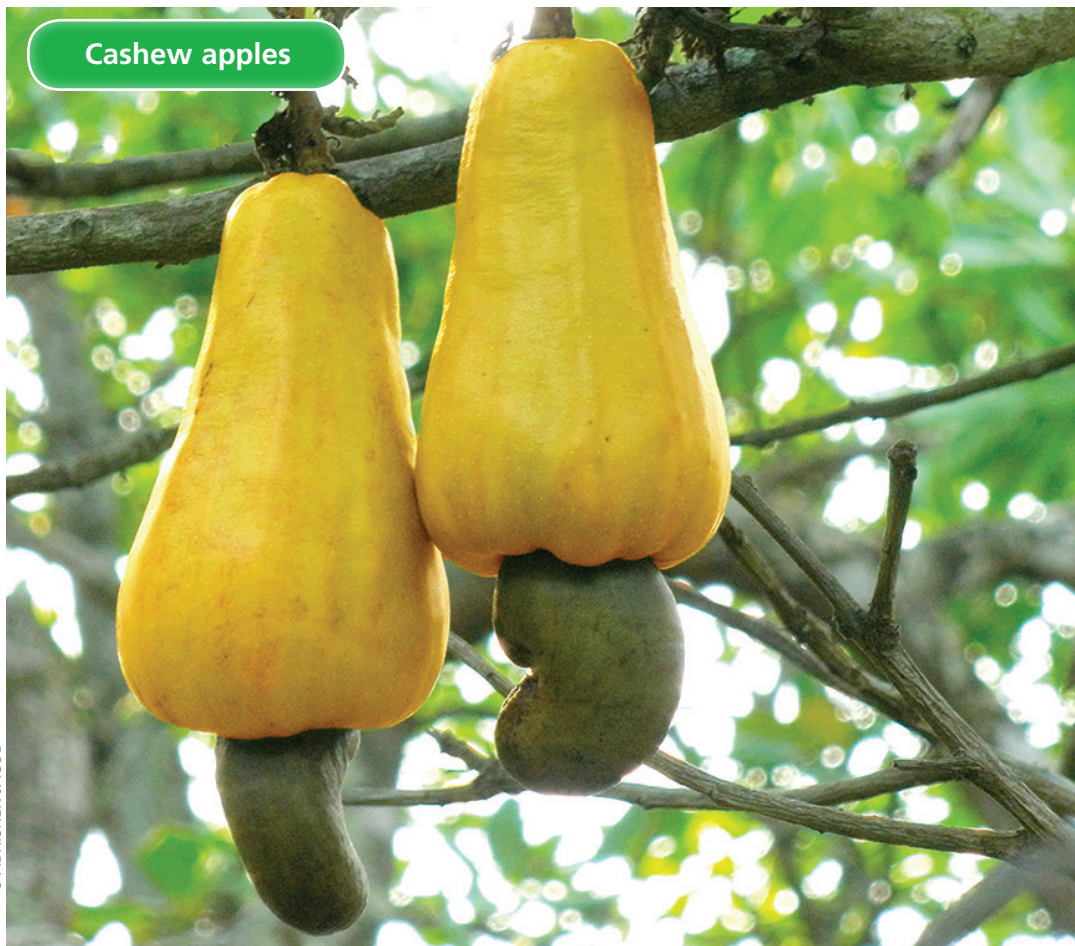
© D. EICKHOFF

### 5.2.3 BARRIERS TO FRUIT AND VEGETABLE PROMOTION/CONSUMPTION

Each country needs to identify potential barriers specific to their own situation but may consider the following general barriers and those more specific to each consumer domain.

General barriers to fruit and vegetable promotion:

- climate – seasonality, water availability, extremes of heat and cold, drought, rain;
- lack of horticultural technology and knowledge of management practices;
- competing government priorities (e.g. policies promoting cereal production on arable land or with available irrigation water);
- economic issues – price, income, affordability at a local and individual level;
- attitudes of producers;
- cultural influences on consumers – traditional diets and cooking practices (can be both barrier and facilitating factor), cultural misperceptions affecting dietary preferences (e.g. fruit causes diarrhoea);
- taste and habit formation of diet patterns in childhood;
- lack of awareness/knowledge of benefits of fruit and vegetables, of preparation of fruit and vegetables, of what constitutes a balanced diet as income increases (role of increasing meat/fat consumption), also misperception of advertised health claims of other products (functional foods);
- unhygienic practices in production and preparation of food;
- perception or communication of food-safety risks – chemical or microbiological contamination (should be emphasized relative to the risk in each country, where applicable);



© ABHISHEK JACOB



- misinterpretation or distortion of information by the mass media;
- introduction or rapid increase of fast-food culture; ready-to-eat fruit and vegetables are not easily available, but ready-to-eat fast food is easily available;
- competition for funding with other promotion programmes, and with more popular foods;
- social acceptability of fruit and vegetable promotion interventions;
- lack of availability, inadequate marketing facilities;
- negative experiences with overproduction necessitating strategies for diversification, better scheduling, value chain efficiency enhancement, and/or production shifts.

### **Rural smallholders producing fruit and vegetables for own consumption and market supply**

Specific barriers to fruit and vegetable promotion according to consumer domain:

- extreme poverty of producers and consumers
- low-quality varieties of crops (no crop improvement)
- non-availability of seeds/planting material
- human resource and labour constraints
- lack of basic enabling knowledge.

### **Mixed consumers – rural and urban gardeners, but also dependent on market supply**

- insufficient land and/or lack of urban/periurban land-use policies for horticulture
- low income
- lack of appropriate technology
- inadequate supplies of clean water and thus food contamination risks.

### **Market-dependent consumers**

- high price of fruit and vegetables in retail outlets
- change in employment and lifestyle with urbanization; lack of time for preparation and cooking as urbanization increases and more women work outside the home.

### **Institutional consumers**

- acceptability and feasibility of promotional programmes
- interests of the institutional food provider competing with fruit and vegetable promotion.

## **>>> 5.3 Identification of stakeholders**

The possible stakeholders to be involved in both promoting increased supply and demand of fruit and vegetables are listed below. At the national level, each country should make an assessment of its relevant stakeholders.

### **Public sector**

- Ministry of Health – public health and health promotion
- Ministry of Agriculture, Food and Fisheries (horticulture development and marketing departments, irrigation department, extension departments)
- Ministry of Education – research (university, scientific leadership), nutrition education
- Ministry of Social Development – food security, land reform

- Ministry of Labour – worksite programmes, worksite hazards
- Ministry of Public Works/planning
- Ministry of Water Affairs
- Ministry of Transport
- Ministry of Environment
- Ministry of Women
- Ministry of Information/communication
- Ministry of Science and Technology
- Regional and local governments, municipalities (e.g. local land use planning, market organization)
- Government department or agency responsible for food safety
- School and hospital administrations.

### Private sector

- Agricultural input suppliers
- Producer organizations – small/ medium/ large or rural/periurban/urban
- Fruit and vegetable industry – processing, packaging, transport, (storage)
- Fruit and vegetable marketing associations – small and large retailers, wholesalers, shipping companies, importers
- Media e.g. journalists’ associations
- Financial institutions – banks, micro-credit institutions
- Heads of companies
- Worksite management
- School and hospital administrations.

### Nongovernmental organizations/civil society

- Community groups (including garden, women’s, cultural, and religious groups)
- Consumer groups
- Health promotion organizations (e.g. cancer, CVD), food-security, environment, agriculture etc.
- Farmers’ cooperatives/associations, women’s producer groups
- Farmers’ unions
- Horticulture promotion groups e.g. fruit and vegetable associations
- Parent–teacher associations
- Traditional healers
- Community/religious/traditional leaders
- Health professionals’ associations (doctors, nutritionists, nurses).

### International bodies

- WHO, FAO, UNDP, UNICEF, WFP, World Bank, IFAD, and their regional or national representatives,
- Regional economic groupings e.g. European Union, African Union, Association of Southeast Asian Nations, South African Development Community, etc.
- Bilateral donors

- Consultative Group on International Agricultural Research (International Food Policy Research Institute and others).

## >>> 5.4 National coordinating team

### 5.4.1 CONSTITUTION OF NATIONAL COORDINATING TEAM

There is a need to ensure that a multisectoral coordinating mechanism, drawing upon existing structures, is present to promote fruit and vegetable production, supply, and consumption. When selected, members of this coordinating team should draw upon other stakeholders (yet to be identified) and ensure visibility of the team.

The coordinating team should provide leadership at national level and define mechanisms for its internal leadership.

The coordinating team could involve representatives from the following areas:

- agriculture/horticulture sector
- nutrition sector
- public health sector (e.g. public health nurse)
- education sector
- financial sector
- private sector in general
- farmers' unions, smallholders' associations (representing producers)
- consumers' associations
- academic sector (especially for programme design and monitoring)
- local community leaders
- women's groups.

### 5.4.2 ROLES OF NATIONAL COORDINATING TEAM

A range of possible roles for the coordinating team are proposed below. At country level, the appropriate roles for the team need to be determined based on this list, to which others may be added.



- To facilitate the development and implementation of national intervention programmes, including resource mobilization.
- To create an environment for stakeholders to pursue these programmes with their respective departments and institutions.
- To take responsibility to advocate for, and guide, policies and actions (including research and extension) and strategies/action plans to be implemented by various stakeholders at various levels.
- To coordinate action of different stakeholders.
- To monitor different programmes aimed to increase consumption and report on a regular basis.
- The national-level coordinating team should be responsible for developing coordination at different administrative levels, i.e. national, regional, municipal.

### Points raised in the discussion

The Coordinating team:

- cannot develop policies, they can only guide
- should promote the decentralization process
- should have accountability and transparency

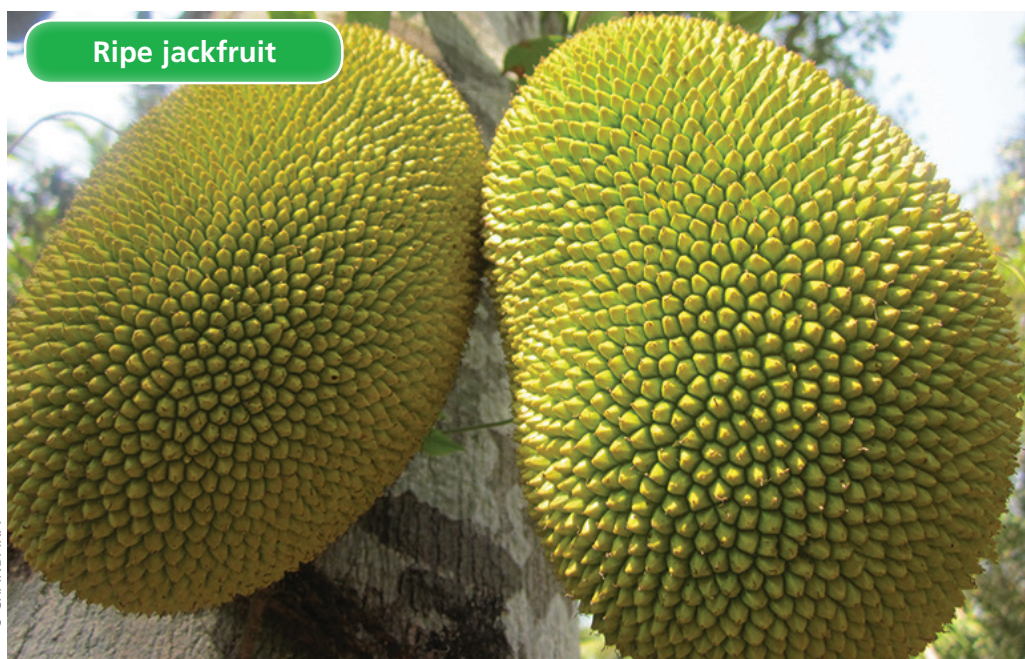
Leadership: could be joint, or rotating e.g. between Ministries of Health and Agriculture – but should ultimately be left to the country to determine.

## >>> 5.5 Identification of national goals and objectives

Goals will differ from country to country and, in particular, according to the kinds of nutrition-related problems that fruit and vegetable promotion programmes are seeking to address. General goals are suggested below:

### Overall goal

To contribute to the prevention and control of NCDs and micronutrient-deficiency diseases through increased production and consumption of a variety of fruits and vegetables.





### Health goal

- Improve nutritional status, specifically decreasing micronutrient deficiencies and the risk of under-, and over-nutrition, and hence the risk of NCDs.

### Nutrition goals

- Increase fruit and vegetable intake.
- Bring individual consumption of fruit and vegetables to at least 400g per day in order to decrease prevalence and incidence of chronic diseases and reduce micronutrient deficiencies.

### Production goals

- Increase availability of fruit and vegetables.
- Increase production and/or availability of adequate amounts of fruit and vegetables to allow consumers to achieve the medium and long-term recommended consumption goals.

### Distribution goals

- Improve efficiency of distribution networks and marketing possibilities for small-scale producers of fruit and vegetables through availability of transparent price information and promotion of fair and sound practices by intermediaries.

#### 5.5.1 CONSIDERATIONS REGARDING GOAL-SETTING

National programmes should establish realistic goals and timeframes, according to circumstances.

Beneficiaries should be the national population, i.e. consumers, with positive side-effects such as improving socioeconomic status of producers.

Culturally-relevant fruit and vegetable consumption targets should be set, but they should encourage people to increase the amount of fruit and vegetables they eat, preferably fresh or adequately processed, e.g:

- 400 g/day minimum fruit and vegetable intake as population nutrient intake goal is an important global long-term health target.
- Using the 400 g/day minimum goal as a short- or medium-term objective may not be appropriate or achievable, for example in African countries where current consumption is so low.
- It may be appropriate to set a target for the proportion of the population to reach the 400 g/day intake goal.
- Keeping numbers in the national objective may be useful but simply globalizing the ‘Eat 5 fruit or vegetables a day’ message (in short: “5 A Day”), used currently in many, mostly developed, countries, is not necessarily considered appropriate. The ‘number’ goal should be set nationally. Its presentation could relate to the number of meals in which people eat fruit and vegetables, or number of plates (e.g. as used in Thailand), or number of portions or number of different types of fruits and vegetables (e.g. as in several European countries and the United States of America) depending on what is best understood culturally.

### Objectives

When setting objectives at the national level to reach these goals, distinguishing between short-, medium- and long-term objectives may be useful, as may differentiation between generic and specific objectives. The following should serve as examples:

*Short-term* – to increase the number of people with home gardens by 20 percent within two years.



*Medium-term* – to increase productivity within existing gardens by 20 percent within five years; to increase diversity of crops grown to at least six per household within five years.

*Long-term* – to increase intake of fruit and vegetables to recommended levels in the target group within 10 years.

### Further examples of specific and generic objectives

#### *Specific*

- Assess current fruit and vegetable consumption to identify and target groups with the lowest intake by reviewing data or using rapid assessment techniques.
- Try to aim for the minimum recommendation of at least 400 g/person per day as the population nutrient intake goal by (set time-frame and allow transition).
- Obtain introduction of policies for augmenting proportion of fruit and vegetables into government food programmes.
- Decrease post-harvest losses and educate target groups about appropriate (according to health needs and availability) conservation and preservation technology (e.g. solar drying, pickling).
- policies on commerce and transportation e.g. small business development and marketing reforms
- food and agriculture taxation policies
- national horticulture plan
- national poverty reduction strategy
- GAP policies (including proper and safe use of pesticides)
- donor programmes (bilateral and multilateral) and priorities.

#### 5.5.2 POSSIBLE INTERVENTIONS AT NATIONAL LEVEL

##### General considerations

It is important to plan both production and consumption interventions in rural, urban and peri-urban areas. The urban/peri-urban setting is very varied in countries regardless of their income level, and even varies regionally within a country. The intervention(s) selected should take account of the particular context in which they are to be introduced. When designing interventions for a country it may be necessary to differentiate those related to fruit from those related to vegetables, since different issues need to be tackled to increase consumption of each, e.g.

- people generally like to eat fruits and they are easy to eat; constraints on their consumption may often be related to price and seasonality
- vegetables need to be prepared, and it is necessary to educate people about preparing and cooking them, as well as emphasizing the need for their increased consumption.

Every intervention programme should be based on a thorough needs assessment and should incorporate an evaluation plan.

## Examples of possible interventions

Examples of areas for action, possible interventions and programmes are provided in the tables below for each consumer domain (target population).

### *Generic*

- Increase and diversify fruit and vegetable production, quality and safety through:
  - empowerment of women
  - job creation.
- Increase availability and affordability of fruit and vegetables.
- Change knowledge, attitudes, behaviour.
- Change/increase amount and variety of fruit and vegetables consumed to ensure a better general dietary pattern (accompanied by an improvement of general dietary pattern).
- Create an awareness within institutions of the need to increase fruit and vegetable consumption.
- Sensitize civil society to the importance of fruits and vegetables through the media.
- Involve the community in services and programmes with nutritional aspects (e.g. provide knowledge and funds to the community).

## >>> 5.6 Activities at national level

### EXISTING NATIONAL POLICIES AND ACTION PLANS

All countries have subscribed to the universal declaration of human rights, cited above, which includes the right to food. Many countries have food and nutrition, or food security, policies and/or action plans (see below) into which a fruit and vegetable promotion policy should ideally be embedded. The multisectoral national coordinating team should identify relevant policies and actions including finance, agriculture, health promotion, environment, food policies.

There may be a need to update, integrate or revise existing national policies (e.g. food security policies) if they do not consider fruit and vegetables. For example: to include promotion of vegetable gardens; to add fruit and vegetables to nutrition policies if the latter are focused on cereals and pulses; to integrate fruit and vegetables in any way feasible in policies and programmes on school feeding, and therapeutic and emergency feeding.



© CCREATIVE-COMMONS-SCOTT BAUER-USDA-ARS

The national coordinating team should also ensure relevant, practice-oriented research to inform policy development.

Policies which may need to be taken into account when planning fruit and vegetable promotion at national level include:

- food security policies and programmes
- nutrition policies (food-based dietary guidelines)
- agricultural (production) policies
- food safety and quality policies
- health policies
- NCD prevention and control policies
- education policies (health education policies) including school curricula
- credit policies
- input policies
- environmental policy
- family farming policy
- labour, land and water policies

Rural smallholders producing fruit and vegetables for own consumption and market supply.

Increase and diversify fruit and vegetable production to achieve year-round diversity, safety and quality.



Build capacity for research for local adaptation, extension, planting-material multiplication, and distribution, focusing on following key aspects:

- *Safety and quality to increase intake:*
  - safe fruit and vegetable programme
  - GAP - focus on pesticide use and prevention of contamination
- *Cultivar improvement, selection and promotion: targeting nutrient content, quality, flavour:*
  - promote crops/varieties with high nutrient levels, e.g. yellow sweet potatoes, dark green leaves, etc.
- *Promoting techniques to extend production season:*
  - phasing production
  - Water

Increase availability and affordability of fruit and vegetables.

Build capacity for:

- *Technologies for post-harvest loss reduction*
  - harvesting technology
  - processing technologies
  - better storage
  - packaging for freshness
  - reducing domestic level losses through education of women
- *Scheduling and managing production to reduce seasonal gaps and gluts to safeguard producer and consumer price convenience*
- *Creating new networks to facilitate transport, haulage and marketing*
- *Increasing small grower involvement and benefit sharing through:*
  - promoting small farmer entrepreneurship
  - promoting schemes for transparent price information and fair practices by intermediaries
  - disseminating market information e.g. boards with prices in rural areas (as practised e.g. in Mozambique)
  - direct marketing (promotion of farmers' markets) change knowledge, attitudes, behaviour
- *Education programmes* – for women, children, farmers, development agents, extensionists, policy makers and planners, managers, subject-matter specialists
- *Access to existing information and knowledge* – ensure use of proper media
- *Behaviour change* – facilitated participatory planning
- *Social marketing* – produce marketing boards, where active, to support groups, programmes, networks

Increase amount of fruit and vegetables consumed, replacing energy-dense, nutrient-poor foods, where needed

- Use local media (especially radio), competitions, role play, theatre, marketplace exhibitions
- Educate mothers about a healthy diet at child-weighting or vaccination clinics, promote fruit and vegetable consumption instead of nutrient-poor foods

Mixed consumers – rural and particularly urban gardeners, but also dependent on market supply.

Increase and diversify fruit and vegetable production, quality and safety

- Collect, collate and disseminate information on successful gardening programmes
- Foster gardening networks, communities, clubs, etc.



- Make land available for gardening in urban and peri-urban areas
- Organize training and extension programmes on gardening, nutrition, food safety, etc.
- Rescue traditional varieties/indigenous fruit and vegetables Increase availability and affordability
- Improve marketing infrastructures
- Promote income-generating programmes

Change knowledge, attitudes, behaviour

- Organize media campaigns
- Review school curriculum and other national policies and strategies to support gardening and educate about health benefits of fruit and vegetables

Increase amount of fruit and vegetables consumed, replacing energy-dense, nutrient-poor foods, where needed

- Develop and promote simple small-scale food preservation methods at household level
- Promote recipes using fruits and vegetables

Increase and diversify fruit and vegetable production, quality and safety

- Work with peri-urban small-scale producers to identify types of fruit and vegetables that are appropriate for these types of projects
- Supply-chain improvement projects addressing efficiency from seed/field through market to table with appropriate technological innovation and information systems; need to take account of food safety issues (use of safe water supply)
- Agricultural training in whole range of techniques and issues about efficient and safe production; from production to preparation for sale. This should include education and training about environmentally-friendly production methods
- Training to ensure that production or food preparation does not have unintended negative health impacts

Increase availability and affordability

- Small scale production/ home production, food preparation and selling (for income generation)
- Alternatives for commercialization – promote approaches to complement distribution through supermarket chains
- Importance of specific policies to support such local supply
- Need to ensure food safety but without impeding small-scale producers from selling at outlets such as street fairs, farmers' markets, mobile markets from trucks

Change knowledge, attitudes, behaviour

- Education targeting women and men about:
  - good nutrition and how to achieve this in the diet
  - fruit and vegetables as part of balanced diet
  - importance of fruit and vegetables for tackling micronutrient deficiencies in children
  - prevention of CVD, obesity, cancer etc.
  - safe preparation and culturally-appropriate cooking and storage techniques
- Mass media education campaigns to inform about the benefits of fruit and vegetables for tackling over-nutrition, NCDs and micronutrient deficiencies. Increase amount of fruit and vegetables consumed, replacement of energy-dense, nutrient-poor foods where needed
- Public education campaigns to promote increased utilization of fruit and vegetables in restaurants (education regarding health benefits and how to increase fruit and vegetable sales)

## Market-dependent consumers

Three key areas of intervention are suggested:

- Communication, education and advertising – three approaches which target a wide population but which tend to be expensive;
- More targeted interventions involving changes in the environment, i.e. through improving access to, and availability of, fruit and vegetables – these require intersectoral action;
- Regulation, e.g. fiscal policies, regulation of health claims or advertising, facilitation of sound health claims for fruit and vegetables.

Increase and diversify fruit and vegetable production, quality and safety

- Linked to institutional feeding programmes organized by the government e.g. for hospitals, camps, armies, schools, correctional facilities, provide seeds and training to help local communities produce fruit and vegetables for feeding programmes
- Supply-chain-based horticultural development projects to encourage farmers and peri-urban growers in suitable areas to grow fruit and vegetables and benefit from value chains linked to institutional feeding programmes

Increase availability and affordability of fruit and vegetables

- School-linked gardens:
  - encourage the use of indigenous fruits and vegetables; teach both boys and girls how to cook
  - get parents and other adult members of wider school community involved

Change knowledge, attitudes, behaviour

- Engage public figures to promote increasing intake of fruit and vegetables (e.g. in Thailand a royal figure is promoting health and nutrition, in the USA a senator is promoting fruit in schools in his state)
- Link healthy diet with physical activities/sports
- Give recognition to NGOs and religious leaders working towards promoting better nutrition
- Education regarding cooking and preparation of fruit and vegetables for food workers in communities, schools, restaurants
- Retain or (re)insert nutrition and cooking as part of the school curriculum
- School gardens – education regarding gardening and balanced nutrition



Bok Choy

- Field trips to local markets or supermarkets to educate school children about fruit and vegetable availability
- Providing fruit snacks in schools and worksites (e.g. as offered in Denmark, Norway and the UK)

Increase amount of fruit and vegetables consumed, replace energy-dense, nutrient-poor foods, where appropriate

- School food programmes (at school and national levels; whether free, subsidized or paid meals) tailored so that they increase fruit and vegetable consumption by schoolchildren (i.e. as part of balanced diet, not just about under-nutrition), connected with supply-side interventions to promote/support local production
- Government food programmes need to be consistent with national nutrition policies and should promote purchase and consumption of fruit and vegetables.

Institutional consumers

General considerations regarding interventions that could be advocated as part of a national agenda include:

- Specific strategies in schools, worksites and other institutions – must consider literacy, access to media, rural or urban environment, gender roles, social roles, food industry, and national policies.
- National policies should attempt to create a win-win situation, e.g. primary and food industry may be encouraged to work with these programmes through the opening of large government-brokered markets (e.g. school lunch programmes, and home-grown supply schemes).
- In terms of gender roles, it is useful to get women involved in supply-chain optimization, including education in the kitchen.
- Schools and hospitals are visible to the public; if they are not consistent and they promote healthy diets but actually provide unhealthy food they undermine the whole programme. Hospitals and schools represent a good opportunity to not only promote healthy diets but also provide healthy food.

## >>> 5.7 Sources of data and data collection

Collection of data on supply and consumption of fruit and vegetables should be integrated into a national nutrition monitoring system (e.g. including anthropometry, food balance sheets, food surveys). It is essential to collect or utilize (as far as possible) existing primary and secondary data to understand current behaviours of consumers and producers. Many countries already collect routine data on dietary habits, agricultural production etc. most of which can be accessed and used when developing a fruit and vegetable promotion programme.

Ideally, the national coordinating team should include a specialist who can supply or collect these data, or the team should plan or commission this work from the start. Collection of specific data, using an appropriate methodology, may be required for an intervention programme. All data collected should be made public and be used for the purpose of the programme.

### General sources of data

These include:

- agricultural census reports;
- dietary intake surveys, including in institutions, where assessment of supply can also be carried out if sources of fruit and vegetables are identified, e.g. cafeteria, brought from home, bought outside;
- purchase data on food items bought by institutions e.g. worksites, hospitals, military establishments.

## Data provided by FAO and WHO

Helpful web sites to access data provided by FAO and WHO include:

### FAO

General site to all statistics:

[http://www.fao.org/waicent/portal/statistics\\_en.asp](http://www.fao.org/waicent/portal/statistics_en.asp)

### WHO

InfoBase on risk factors for chronic diseases:

[http://www.who.int/ncd\\_surveillance/infobase/web/en/](http://www.who.int/ncd_surveillance/infobase/web/en/)

Micronutrient deficiency information system:

[http://www.who.int/nut/db\\_mdms.htm](http://www.who.int/nut/db_mdms.htm)

## Methodology for data collection

General methodologies which can be used to collect data in all consumer domains include:

- World Bank/International Food Policy Research Institute survey technique
- participatory rural appraisal
- rapid rural appraisal.

Simple, valid and rapid tools are needed to collect data for all groups on supply and consumption e.g. rapid appraisal tool.

### *Baseline data*

Information that should be collected as baseline data, if not already available:

- what people buy and what they eat on a daily basis (by age, sex, household size, marital status, income or educational status)
- where people obtain fruit and vegetables
- where people eat: home, restaurants, schools, worksites, street food
- how they eat (which form of food, cooking etc)
- cost of fruit and vegetables from different supply sources, and price of fruit and vegetables compared with different food types.

### *Some general principles for data collection*

- ensure that qualified persons (e.g. university researchers) are carrying out the data collection and that the methodology is standardized and validated;
- sensitize researchers to the kinds of data needed, and avoid overly-complicated research;
- create a central databank in the country e.g. in bureau of statistics;
- link assessment surveys to monitoring and evaluation.

## >>> 5.8 Monitoring and evaluation

The following general principles should be stressed:

- Create a culture of evaluation – build capacity for monitoring and evaluation.
- No programme should be contemplated which does not include a mechanism for regular evaluation. Incorporate monitoring and evaluation into the planning, design and implementation processes, and include a specific budget allocation for monitoring and evaluation.



- Define the monitoring and evaluation strategy during programme design, ensuring the availability of baseline data and planning of initial surveys such that they can be used for monitoring in the future.
- Use experts in the evaluation team (e.g. statistician, economist for cost-benefit analysis, programme manager to determine what should be evaluated).
- Do in-process monitoring frequently, but formal evaluations to change guidance less often.
- Monitor all guiding principles: accessibility, affordability, etc.
- Ensure dissemination of evaluation results.

### What should be monitored?

Monitor process (operational, implementation aspects), outcome (e.g. is fruit and vegetable consumption increased), impact (e.g. on health) and cost-effectiveness.

#### *Process evaluation*

All programmes should include process evaluation for troubleshooting and to achieve effective implementation, i.e. to:

- assess whether the programme is being implemented as planned
- identify constraints to implementation
- use information to improve implementation; identify, test, and implement corrective measures as needed.

#### *Outcome evaluation*

This should be undertaken to assess whether intended outcomes have been achieved as a result of project implementation.

#### *Impact evaluation and cost-effectiveness*

Careful, rigorous evaluation needs to be conducted to test impact and cost-effectiveness of the intervention programme in different contexts.

However, this does not need to be done for all programmes because it tends to be cost- and resource- intensive. The impact evaluation should focus on assessing whether the programme has reached its stated goals, and also assessing success factors.

### Selecting appropriate indicators

#### *Process evaluation*

Include indicators of

- targeting (e.g. whether the intervention is reaching its targeted beneficiaries)
- coverage (what percentage of the population is being reached)
- provision/delivery (whether the intervention is delivered as planned, what can be done to improve operational aspects of the programme and make implementation more effective).

#### *Outcome evaluation*

Indicators that mark the outcome could be for example:

- whether fruit and vegetable consumption at the population or household level has increased;
- whether intake at the individual level has increased for different age groups;
- whether the availability of fruit and vegetables was increased.

### *Impact evaluation*

Indicators are needed that illustrate if the intervention is meeting its stated objectives – for example:

- whether nutritional status has changed (e.g. less deficiency of a micronutrient)
- whether risk factor profiles for NCDs are maintained or improving
- whether health status has improved.

Some indicators from ongoing surveys could be used, for example:

- dietary surveys for monitoring intakes
- biochemical indicators for monitoring micronutrient deficiencies
- anthropometric measures for monitoring obesity
- illness and hospitalizations for monitoring chronic diseases.



# Annex 1

## Workshop conclusions

Based on the challenges identified through the assessment, as well as country case studies, elements, entry points and next steps were identified for immediate, medium term (2-3 years) and long term (3-5 years) action at country level through group discussions. Groups were divided in accordance to the characteristics of the countries. The groups analysed and discussed:

- the policy and strategy environment related to availability and accessibility of produce, production capacity, and supply policy; public health policy and system; education policy and system – in terms of strengths and challenges;
- charting the challenge of increased F&V supply and consumption;
- elements of a framework for action; and
- strategies to foster and promote coordinated action

### Key Conclusions from Group 1

**Participants:** Samoa (2), Tonga (1), Niue (2), Cook Islands (2) and Tuvalu (3)

**Facilitators:** Alison Hodder, Siosuia Halavatau and Graham Lyons

**Session 1: Main health problems, challenges, characteristics and positive aspects (strengths) at national level?**

Challenges	Solutions
<ul style="list-style-type: none"> <li>• Obesity, aging farmer population, low fruits and vegetables, physical inactivity, teenage pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>• Enact and strengthen food laws &amp; regulations for healthy diet and physical activity</li> <li>• National strategy on FV aligned to the WHO strategy on diet, physical activity, and health</li> <li>• Strengthen implementation of NCD policies &amp; strategies</li> </ul>
<ul style="list-style-type: none"> <li>• land availability and access to land</li> <li>• Water availability for agriculture</li> <li>• Improper and abuse in use of pesticides</li> <li>• Poor soil health and fertility, P&amp;D problems including roaming animals</li> <li>• High post-harvest losses</li> </ul>	<ul style="list-style-type: none"> <li>• National Food Security framework</li> <li>• Go Local campaign to promote production and consumption of local food</li> </ul>
<ul style="list-style-type: none"> <li>• Climate change effects ; drought, sever cyclones, salt-water intrusion</li> <li>• Climate change – drought, salt water inundation</li> </ul>	
<ul style="list-style-type: none"> <li>• Lack of data around production, sales, consumption, price change</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct surveys</li> </ul>



## Session 2: Constraints to Increasing F&V Production and Consumption and Target Groups

Constraints	Solutions
<ul style="list-style-type: none"> <li>Lack of promotion of production of F&amp;V</li> </ul>	<ul style="list-style-type: none"> <li>Key stakeholders including Agriculture, Education, Health, Tourism, Hospitality Training Centre, Business Trade and Investment Board; community incl. traditional, church leaders</li> <li>On-going commitment on F&amp;V promotion</li> <li>All countries have NCD's - review and assess existing FS programmes and develop new ones</li> </ul>
<ul style="list-style-type: none"> <li>Small land areas, inadequate water supply</li> <li>Water availability for agriculture</li> </ul>	<ul style="list-style-type: none"> <li>Pacific food secure framework – adopted at Regional Food Summit, Vanuatu 2010</li> </ul>
<ul style="list-style-type: none"> <li>Land availability and access to land</li> <li>Poor soil health and fertility, P&amp;D problems including roaming animals</li> <li>Improper and abuse in use of pesticides</li> <li>High post-harvest losses</li> </ul>	<ul style="list-style-type: none"> <li>Competent, credible, reliable, experienced extension officers</li> <li>Farmer-to-farmer mentoring</li> </ul>
<ul style="list-style-type: none"> <li>Lack of diversity in current production</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen regional programmes – exchange of materials, ratify ITPGRFA</li> </ul>
<ul style="list-style-type: none"> <li>Lack of understanding of benefits in the consumption on F&amp;V</li> </ul>	<ul style="list-style-type: none"> <li>Pictorial demonstration of 5-servings a day</li> <li>Target Kindergarten and primary school students = 3-9 year olds</li> <li>Baseline data - study select population (school students)</li> <li>Promote school food gardens; and include nutrition and local F&amp;V in the curriculum</li> <li>Peoples attitude and lifestyle important in changing NCD</li> </ul>

## Session 3: On-going Programmes/Projects that fit the FV initiative at national level

### Demonstration and celebrations

- Annual Agriculture Show, Show-day, World Food Day Celebrations
- Farmer field-days and demonstration plots
- Farmer Field Schools promoting alternatives for herbicides, IPM programmes

### Programmes on nutritional aspects and health issues

- Health Nutrition promotion programme and FAO/SPC food security programmes
  - Shift in diet – “good kaikai as opposed to rubbish kaikai”
  - School garden and feeding monitoring – Agriculture, Health, Education
  - Dieticians, nutritionists, agriculturists to know how to cook and plant
  - Managing compliance with food standards/guidelines in school based programmes
  - Short-term health changes in NCD risk factors (BP, BMI, Cholesterol, Blood Glucose)
  - Long-term changes in NCD prevalent
- Utilise existing structures such as Nutrition Centres, Home economics in schools, hospitality training centre

## Partnerships

- Use of sports role models to promote FV
- Strengthen Public-Private Partnerships

## Information collation

- Demographic health surveys; health census; health steps
- Fruits and vegetable baseline survey; market information survey
- Changes in land use, cultivation, production, sales

## Session 4: Promoting co-ordinated action

Promotion of local fruit and vegetable production and consumption	<ul style="list-style-type: none"> <li>• Chamber of commerce = links, supports, structures, tourism board/authority , Ministry of Trade= promotion of local FV, Go Local</li> <li>• National food and nutrition co-ordinating committee ; Health boards</li> <li>• NCDs forum/roadmap; Food security/NCD/working group</li> <li>• Psychological “walk the talk”</li> </ul>
increased production	<ul style="list-style-type: none"> <li>• Farmers/growers associations = increased production cater to markets, access capital/funds, import of supplies (seeds, fertilizers, chemicals)</li> </ul>
Community social development	<ul style="list-style-type: none"> <li>• National community social development ; Education, Churches, Village council Women in business</li> </ul>
Food security and resilience	<ul style="list-style-type: none"> <li>• CC – Food Security, building resilience to CC programmes</li> </ul>
Involvement of stakeholders	<ul style="list-style-type: none"> <li>• Greater support from top level ministries</li> <li>• To ensure active enforcement get KEY stakeholders on-board and call others as needed SPC, FAO, WHO – development partners</li> <li>• USP and other Universities – capacity building, national training</li> <li>• ACIAR – research and development</li> </ul>
Networking and information sharing	<ul style="list-style-type: none"> <li>• Networking among programme managers, sharing information and experiences, health, agriculture, education</li> <li>• Need websites of FAO, SPC to make available information</li> <li>• FV for health newsletter</li> </ul>

**Session 5: Describe specific actions that can be done in the 12-months following the workshop and who/which institution would be responsible by acting**

- Strengthen stakeholder collaboration at regional and national level
- Establish national steering committee on promoting F&V consumption - comprising of key stakeholders (Agriculture, Health, Education, NGOs, Church, Community etc  
- Committee chaired by high level delegate: Minister or PM
- Incorporation of F&V programme into national budget process
- Promote National projects to facilitate F&V
- Promote regional projects such as TCPs and others
- Advocacy through high level forum such as Agriculture ministers meetings 2015
- Pacific Health Ministers to advocate via International conference on Nutrition, FAO Headquarters Nov '2014
- Establish Regional Platform for Food Security-Nutrition-NCD
- Strengthen capacity, knowledge, understanding of farmers, school students, health officials, NGO's and communities in F&V (teaching materials, school demonstration plots, backyard and container planting)
- Strengthen research & development in fruit and vegetables - high and low-lying atoll islands
- Strengthen propagation and supply of planting materials to farmers and communities
- Encourage soil improvement options including composting, green manuring etc

**Key Conclusions from Group 2**

**Participants:** Marshall Islands (3), Kiribati (1), Vanuatu (3) and Fiji (2)

**Facilitators:** Makiko Taguchi, Alistair Gracie and Minwook Kim

Production/availability constraints	Solutions
Year-round supply of F&V	<ul style="list-style-type: none"> <li>• Increase diversity of F&amp;V.</li> <li>• Trial different systems of production. Promoting urban, peri-urban production for home consumption (e.g. containers).</li> <li>• Domestication of indigenous F&amp;V</li> </ul>
Accessibility of good planting material	<ul style="list-style-type: none"> <li>• Fiji – government involved in seed production and distribution.</li> <li>• Private, local seed producers encouraged.</li> <li>• Cooperation among countries facilitated by SPC, with consideration given to biosecurity and certification requirements.</li> </ul>
Declining soil health/fertility	<ul style="list-style-type: none"> <li>• Improving and promoting composting practices (RMI)</li> <li>• Educating farmers/locals about composting techniques.</li> <li>• Promote use of pulses/legumes, intercropping etc that lead to higher soil organic matter.</li> <li>• Improving integrated livestock/plant production systems.</li> </ul>

Production/availability constraints	Solutions
Transportation, storage,	<ul style="list-style-type: none"> <li>• Improving cooperation/coordination among farmers.</li> <li>• Government to support transport (year-round) and construction of appropriate storage facilities.</li> <li>• Collection centres.</li> <li>• Creating local/village markets.</li> <li>• Increase understanding among farmers on postharvest handling practices.</li> </ul>
Short shelf life/Lack of processing	<ul style="list-style-type: none"> <li>• Build capacity in villages.</li> <li>• Provision of small-scale technologies.</li> <li>• Re-introduce traditional knowledge on storing F&amp;V.</li> </ul>
Lack of acceptance of local produce	<ul style="list-style-type: none"> <li>• Educate local populations of nutritional value.</li> <li>• Re-introduce knowledge of culinary/preparation use in local dishes.</li> <li>• Improve convenience where possible (e.g. processing)</li> <li>• Encourage local cuisines in local and tourist restaurants.</li> </ul>
Climate change/salinity	<ul style="list-style-type: none"> <li>• Crop adaptability studies.</li> <li>• R&amp;D to develop saline and drought tolerant crops.</li> <li>• Farming systems: container farming, hydroponics etc.</li> </ul>
Pest and disease	<ul style="list-style-type: none"> <li>• Extension/knowledge sharing of IPM approaches, including traditional methods and biological control</li> <li>• Diversification, companion planting</li> <li>• Promote GAP to avoid build up pesticide resistance</li> <li>• Strengthen regulatory use of pesticides</li> </ul>
Land availability	<ul style="list-style-type: none"> <li>• Enhance efficient use of agricultural land</li> <li>• Promote backyard and front-yard/home gardening.</li> <li>• Container/hanging gardening</li> </ul>
Farmer capacity (e.g. knowledge of IPM strategies)	<ul style="list-style-type: none"> <li>• Foster greater extension via NGO's, farmer organisations</li> <li>• Using farmer field schools</li> <li>• Tailoring extension to level of literacy/experience</li> <li>• Demonstration/hands-on training</li> <li>• Field days to “train the trainer” farmers – targeting lead farmers</li> <li>• Farmer competitions</li> <li>• Economics</li> <li>• Market access information</li> </ul>
Low productivity	<ul style="list-style-type: none"> <li>• Covered above in GAP, training etc.</li> <li>• Incentives to encourage productivity.</li> </ul>



Production/availability constraints	Solutions
Diversity of varieties	<ul style="list-style-type: none"> <li>• Long-term, strategic approach to crop breeding, selection of indigenous varieties etc.</li> <li>• Trial existing varieties</li> <li>• Cooking shows and demonstrations, including via dieticians etc</li> <li>• Proactive approach to commercialisation of local/ traditional crops</li> </ul>
Poor extension services	<ul style="list-style-type: none"> <li>• Increase ratio of extension officers to farmers</li> <li>• Foster greater extension via NGO's, farmer organisations</li> <li>• Greater sharing of information/extension material among countries</li> </ul>
Lack of coordination within supply chain	<ul style="list-style-type: none"> <li>• Improve information sharing/communication along the value chain.</li> <li>• Using communication devices (eg mobile phones) to improve information sharing to improve regular supply of produce</li> <li>• Improve understanding of existing supply/value chains</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>• Improve supply of water to farms: miracles, desalination plants, water catchment systems, irrigation schemes, recycling. Harvesting rainwater.</li> <li>• Coordinated transport</li> <li>• Collection centres with storage facilities etc.</li> </ul>
Lack of interest in agriculture/ poor resource use due to emigration of farmers	<ul style="list-style-type: none"> <li>• Government grants to encourage greater interest in ag</li> <li>• Agriculture within curriculum (present in some schools and countries)</li> <li>• Strengthen links between education and agriculture through career forums/expos</li> <li>• Changing perception of agriculture from hard work with low pay to technology oriented and business driven</li> <li>• Promote agriculture shows and awards</li> <li>• Success stories/role models</li> </ul>

Country	Priority plans	Stakeholders	Lead
Vanuatu	<p>Healthy school and correction service settings:</p> <ul style="list-style-type: none"> <li>• Target “pilot” schools and surrounding communities (Peri-urban schools (focus on boarding schools))</li> <li>• Provide diverse range of plant material and technical support to establish gardens and foster healthy eating habits.</li> <li>• Target schools are primary and secondary</li> <li>• Work with health and agriculture teachers</li> </ul> <p>Priority action agenda for government. – to reach 2016 “Healthy, Wealthy, Educated Vanuatu”</p> <p>Support conservation of OP seed lines</p> <p>Promote IPM vegetable production practices</p> <p>Establish breeding programme for local indigenous fruit trees.</p>	<p>Government Departments</p> <p>Dept. of Public Health Dept. of Agriculture VARTC Dept. of Local Authorities Dept. of Education Dept. of Biosecurity</p> <p>Local NGOs LLEE (Live &amp; Learn Organisation) WSB (Wan Smol Bag Theatre) Farm Support Association Red Cross Care International ADRA</p> <p>WHO UNICEF UNDP VTWG SPC FAO ACIAR</p>	<p><b>Dr. Roger Malapa</b></p> <p>Jean Jacques Rory/ Nellie Muru</p> <p>Fernand Massing</p>

Country	Priority plans	Stakeholders	Lead
Fiji	<p>Health promoting primary schools</p> <ul style="list-style-type: none"> <li>Educating population on nutritive value of indigenous vegetables/fruit using mass media</li> <li>School gardens including vegetables and fruit trees</li> </ul> <p>Health facilities</p> <ul style="list-style-type: none"> <li>Cooking shows using local cuisines by dieticians</li> <li>Establish fruit trees in hospital garden</li> </ul> <p>Establish farming field schools</p> <ul style="list-style-type: none"> <li>Through existing programme</li> </ul> <p>F&amp;N policy developed next year for 2015. PROFAV to fit within this policy area</p> <ul style="list-style-type: none"> <li>FPAN 2016-2020 will include details of programmes and activities of PROFAV</li> </ul>	<p>NFNC WC FPAN SC HPS SC FT TAG NA DN FIND Nutrition CSN FB HAG SPC FAO ACIAR MOA MOE Farmer Association Consumer Council AMA CLC FBO Provincial structures</p>	<p><b>Ateca Kama</b> Dr Isimeli Tukana Mr Ilimeleki, CE MPI Mr Tikiko Lewesi Dr Peter Hoejskov Mrs Jiutajia Tikoitoga Ms Ditoga Kabukeinamala Ateca Kama Mrs Jowalesi Taukei</p> <p>Shalendra Prasad Mr Tikiko Lewesi</p> <p>Josua Namoce Alifereti Yaya</p>

Country	Priority plans	Stakeholders	Lead
RMI	<p>Improving student understanding of nutritional value of F&amp;V and assessing learning outcomes using MISAT. This will include:</p> <ul style="list-style-type: none"> <li>• better utilisation of primary and secondary school gardens</li> <li>• education and training of schools,</li> <li>• pre and post MISAT assessments and health aspects</li> <li>• cooking demonstrations – traditional knowledge in preparing and cooking indigenous fruit and veg.</li> </ul> <p><b>Long term (order of priority)</b></p> <ul style="list-style-type: none"> <li>• climate change (incl. pest and disease, )</li> <li>• promote home gardens</li> <li>• capacity building farmers</li> <li>• transportation (outer islands) and storage (shelf life)</li> <li>• diversity</li> <li>• infrastructure</li> <li>• soil health and fertility</li> </ul>	<p>MOH R&amp;D MOE EPA WUTMI YTYIH KUTMIT FBO MOFA NGOs Wellness Center MIEPI SPC FAO ACIAR</p>	<p>Charlyne A. Alfred/ Carlinda Jabjulan Karness Kusto Glorina Harris/ Theresa Kijiner Abraham Hicking Kathryn Rilang Aluka Rakin Janet Nemra Aindrik George Ylissa Kendall Dr. Pinano Ray House May Ipil</p>
Kiri	<p>Educate farmers on GAP</p> <ul style="list-style-type: none"> <li>• making high quality composts</li> <li>• planting techniques.</li> <li>• cultivation of swamp taro using traditional knowledge</li> <li>• postharvest</li> </ul> <p>Priority: Support ongoing research on drought and saline tolerant crops</p> <ul style="list-style-type: none"> <li>• Provide tested planting material to farmers for commercial production</li> </ul> <p>Encourage farmers to capture rainwater by investing in infrastructure (water tanks)</p> <ul style="list-style-type: none"> <li>• Demonstrate benefits of existing investments</li> </ul> <p>Support ongoing activity to establish local markets for farmers to sell produce</p> <p>Support school garden activities (long term)</p>	<p>MELAD-Agriculture MOE-Curriculum section MHMS-Nutrition section NGOs: KOP, LLE, TOFMA SPC FAO ACIAR</p>	<p>Tianeti Benna –OIC Director Eretii Timeon Ahling Onorio, Iataake Totoki Mwamwarau Karirieta</p>



There are existing policies on NCD, agriculture, health and nutrition, food security policies which all have linkages to PROFAV. However, it is necessary to:

- improve links between production and food security and nutrition; and
- establish a work plan to implement existing policies.

### Coordination among stakeholders

**Barriers:** Competing priorities, political interference

**Regional coordination:** SPC, UNICEF, WHO, FAO

- Sharing/dissemination of information among country representatives
- Facilitate technical assistance at a regional level

**Communication:**

- Email network preferred over website. Potential to use FAO PROFAV website to provide relevant material from workshop.
- A one-pager brief to disseminate. Content: PROFAV purpose and benefits
- Good time to contact other relevant ministries so they can include PROFAV in their business plans

**Awareness raising:**

- Linkage with world food day and in Fiji Food and Water day, world health day
- Financial incentives to encourage younger population to engage in ag in Fiji

**Responsibilities of national teams:**

- Goal setting
- Developing indicators for project outcomes
- Incorporate PROFAV into business plans
- Raising Awareness
- Monitoring and evaluation

## Annex 2

### Participants

Participants			
No.	Name	Organisation	Country
1	Dr Alisair Gracie	University of Tasmania	Australia
2	Dr Graham Lyons	A.C.I.A.R & University of Adelaide	Australia
3	Ms Karen Tairer	Ministry of Health	Cook Islands
4	Mr William Wigmore	Director of Research Ministry of Agriculture	Cook Islands
5	Ms Ateca Kama	Ministry of Health National Food & Nutrition Center	Fiji
6	Mr Halavatau Siosuia	Deputy Director Land Resource SPC	Fiji
7	Mr Ropate Ligairi	Permanent Secretary Ministry of Agriculture	Fiji
8	Mr Shalendra Prasad	Principal Research Officer (Horticulture) Ministry of Agriculture	Fiji
9	Ms Alison Hodder	FAO, Senior Horticulture Officer	Italy
10	Ms Makiko Taguchi	FAO, Agricultural Officer	Italy
11	Mr Minwook Kim	FAO, Agricultural Officer	Italy
12	Ms Rutiana Karebwa	Agricultural Officer	Kiriabti
13	Ms Carlinda Jabjulan	Diabetes Coordinator Ministry of Health	Marshall Islands
14	Mr Karness Kusto	Asst. Chief of Agriculture Quarantine Livestock Ministry of Resources & Development	Marshall Islands
15	Ms Theresia Y Kijiner	Curriculum Specialists Ministry of Education	Marshall Islands
16	Mr Dean Phil Nevalagi	Ministry of Education	Niue
17	Ms Rose J Sionhane	Charge Nurse Ministry of Health	Niue
18	Ms Eleutildu C Vainikolo	Ministry of Agriculture & Food, Forests & Fisheries	Tonga
19	Mr Aasa Tealofi	Senior Agricultural Officer Ministry of Natural Resources	Tuvalu
20	Ms Pauke P Maani	Ministry of Health Nutrition & Dietetic PHU	Tuvalu
21	Mr Sosea Tusialofa	Education Officer Government of Tuvalu	Tuvalu
22	Mr Liu Pueata Tanielu	Principal Crops Development Officer	Samoa
23	Mr Sinei Fili	Principal Officer Ministry of Health	Samoa
24	Mr Peter Sousa Hoejskov	WHO, Technical Officer, Food Safety and NCD	Switzerland
25	Ms Nellie Muru	Ministry of Public Health	Vanuatu
26	Dr Malapa Roger	VARTC	Vanuatu
27	Mr Massing Fernand	Agriculture Officer Agriculture Department	Vanuatu



Rambutans





## Annex 3

# Workshop agenda

Monday, 20 October		
08:00	Registration	
09:00	Opening Ceremony <ul style="list-style-type: none"> <li>- Mr. Ropate Ligairi, Permanent Secretary, Agriculture, Fiji</li> <li>- Mr. Peter Hoejskov, Technical Officer, WHO</li> <li>- Ms. Alison Hodder, Senior Officer, FAO</li> <li>- Mr. Siosiu Halavatau, Deputy Director (Food and Nutrition Security Program), SPC</li> </ul>	
10:00	Introduction of participants	
10:30	Group photo and health break	
11:00	Promoting Health through Horticulture	Alison Hodder, FAO
11:15	Importance of Fruit and Vegetables for Public Health and food safety	Peter Hoejskov, WHO
11:45	ACIAR nutritious leafy vegetables activity in the Pacific	Graham Lyons, ACIAR
12:00	The increasing mismatch between consumer-demand, health, and supply of fruit and vegetables in Tasmania	Alistair Gracie, Univ. of Tasmania
12:15	Lunch	
14:00	Keynote – Improving the nutritional status of the population in Fiji	Ateca Kama, Min. of Health, Fiji
14:30	Presentation of STEPS methodology for surveillance of major health risk factors or other key topic suggested	Peter Hoejskov, WHO
14:50	PROFAV survey analysis and introduction of detailed survey	Minwook Kim, FAO
15:10	Discussion	
15:45	Health break	
16:15	Keynote - Increasing production of fruits and vegetables in the Pacific Islands - <i>Challenges and Strategies</i>	Siosiu Halavatau, SPC
16:45	Invited case study presentations	
17:15	Discussion	
17:30	Introduction of working group sessions <ul style="list-style-type: none"> <li>- Formation of working groups</li> <li>- Working group objectives, themes, methods and expected results</li> </ul>	Facilitation Team
18:00	Close for the day	



Tuesday, 21 October		
09:00	Opening for the day and recap of yesterday	
<b>Working group sessions</b>		
09:30	Session 1 : Policy and strategy environment (health break at 10:30)	Facilitation Team 1: Alison Hodder, Siosiu Halavatau 2: Makiko Taguchi, Peter Hoejskov 3: Minwook Kim, Alistair Gracie
13:00	Lunch	
14:00	Session 2 : Charting the challenge of increased F&V supply and consumption	
15:30	Health break	
16:00	Session 3 : Elements of a framework for action	
17:30	Close for the day	

Wednesday, 22 October		
09:00	Session 4 : Promoting coordinated action (health break at 10:30)	
13:00	Lunch	
14:00	Session 5 : Outcomes of the workshop - Review and conclusions in groups	
16:00	Health break	
<b>Plenary</b>		
16:00	Session 6 : Working group reports and discussions	Moderator: Alison Hodder
18:30	Close for the day	

Thursday, 23 October		
10:00	Draft report review and adoption of the workshop conclusions	Facilitation Team
12:30	Closing ceremony	
13:00	Lunch	

# Annex 4

## Questionnaire Instructions

### Assessment of Fruit and Vegetable Production and Consumption in the Pacific Region

#### INSTRUCTIONS AND DESCRIPTIONS

- **Overview**

The questionnaire contains the following sections:

Section 1: Production and trade

Section 2: Consumption of fruit and vegetables in the country

Responses to Part I (Production and Trade) should be just by participants in Ministries, institutions or organizations related to horticulture production and Part II (Consumption) just by participants in Ministries, institutions or organizations related to Health/Nutrition.

- **Questionnaire completion**

- On the coverage page, please provide the relevant information on National reporting office, reporting or responsible officer, contact name, etc.
- Data should refer to national and annual coverage. For the purpose of data reporting, kindly provide calendar year figures i.e. January to December. In the case of crops where the harvest extends into the subsequent year, production should be allocated to the calendar year in which the bulk of the harvest takes place.
- If your data has to be guessed, please clearly mark it in 'information sources'.
- Please provide production in metric tonnes (MT) for each selected agricultural commodity.
- Please note that other instructions are included in the questionnaire for some specific questions.
- Description of commodities are given in the section below.
- Official and estimated data currently available at FAOSTAT has been included in Annex 2. Please revise data if necessary and highlight any revision.

Official data previously reported have been included in this questionnaire. Please revise data if necessary and highlight any revision.

Please refer to FAOSTAT data in Annex II (Production) and III(Trade).

- Please note that all data has a symbol, as below.

(blank) = official data

**M** = missing data, or no data

\* = data from non-official sources

**F** = estimated data

**T** = trend data

**P** = Trading Partners data

You can find the name of the persons and the institutions to which the Annual Production Questionnaire is sent in the following table.

Country	Last Name	First Name	Institution
Cook Islands	Tangimetua	Taggy	Statistics Office
Fiji	Bainimarama	Timoci	Bureau of Statistics
Kiribati	Tiroa	Tekena	Ministry of Finance and Economic Development
Marshall Islands			
Nauru	Gadabu	Ipia	National Statistics Office
Niue	Vaha	Kimray	Statistics Niue
Palau	Oilouch	Dennis	Office of Planning and Statistics
Papua New Guinea	Aka	Joseph	National Statistical Office (NSO)
Samoa	Muagututi'a	Sefuiva Reupena	Samoa Bureau of Statistics
Solomon Islands	Kimi	Douglas	Ministry of Finance and Treasury
Timor-Leste	Ferreira	Elias dos Santos	Ministry of Finance
Tonga	Finau	Ata'ata	Statistics Department Tonga
Tokelau			
Tuvalu	Malona	Semu	Central Statistics Division
Vanuatu	Johnson	Simil	Vanuatu National Statistics Office

## DESCRIPTIONS

### • Production

#### - Fruit

Production data of fruit crops relates to fruits actually harvested. **Banana** relates to that used as “Fruit/dessert” while all others are included in **“Plantains”**. Data on **Bananas** and **Plantains** relates to the weight of single Bananas and Plantains, excluding, therefore the weight of the central stalk of the bunches. **Nuts, Olives, Coconuts, Melons** and **Watermelons** are not included as fruit crops. **“Fruit, nes”** includes all other fruits not elsewhere specified (n.e.s) in this group.

When you specify fruit, please refer to **FAO’s 36 primary fruit crops:**

1.Bananas, 2.Plantains, 3.Dates, 4.Figs, 5.Pineapples, 6.Avocados, 7.Mangoes (incl. mangosteen & guavas), 8.Fruit,tropical fresh nes, 9.Oranges, 10.Tangerines,mandarins,clementines,satsumas, 11. Grapefruits and pomelos, 12. Lemons and limes, 13. Citrus fruit, nes, 14. Grapes, 15. Papayas, 16. Apples, 17. Pears, 18. Quinces, 19. Apricots, 20. Sour Cherries, 21. Cherries, 22. Peaches and nectarines, 23. Plums, 24. Strawberries, 25. Raspberries (incl. blackberries, mulberries & loganberries), 26. Blueberries, 27. Cranberries, 28. Berries nes, 29. Currants, 30. Gooseberries, 31. Kiwi fruit, 32. Persimmons, 33. Pome fruits fresh, nes, 34. Stone fruits fresh, nes, 35. Cashewapple, 36. Other fruits fresh, nes

The code and name of each is listed in the link below along with its botanical name, or names, and a short description where necessary.

<http://www.fao.org/economic/ess/ess-standards/comm-items/en/?chapter=8>

- *Vegetables*

Production data should cover only those vegetables which are cultivated exclusively for human food. Crops cultivated both as field crops and garden crops in the open or under glass should be reported together. Certain gramineous and leguminous plants are classified among Cereals and Pulses if they are harvested for the dry grain. Vegetables that are harvested green for the green grains and/or for the green pods (**green maize, green peas, green beans, string beans, etc.**) should be included in this group. Production data for these commodities should include the weight of the pods even though they are not eaten. Vegetables grown principally for animal feed should be excluded from this group and should be included under Fodder Crops. **Cabbages** include **Brussels Sprouts, Green Kale** and **Sprouting Broccoli**. **Cauliflowers** include Heading **Broccoli**. The Vegetables group includes Melons and Watermelon. **“Vegetables, nes”** includes all other vegetables not elsewhere specified (n.e.s) in this group.

When you specify vegetables, please refer to **FAO’s 27 primary vegetable products:**

1. Tomatoes,
2. Onions + shallots green,
3. Onions,dry,
4. Garlic,
5. Carrots,
6. Leeks and other alliaceous vegetables,
7. Cauliflowers,
8. Cabbages,
9. Lettuce,
10. Cucumbers, gherkins,
11. Peas, green,
12. Beans, green,
13. String beans,
14. Broad beans,green,
15. Artichokes,
16. Asparagus,
17. Eggplants,
18. Mushrooms,
19. Chillies and peppers(green),
20. Spinach,
21. Pumpkins, squash, gourds,
22. Green Corn (Maize),
23. Okra,
24. Cassava leaves,
25. Watermelons,
26. Cantaloupes & other melons,
27. Vegetables fresh, nes

The code and name of each is listed in the link below along with its botanical name, or names, and a short description where necessary.

<http://www.fao.org/economic/ess/ess-standards/comm-items/en/?chapter=7>



Star fruit Carambola



# Annex 5

## Questionnaire

### Assessment of Fruit and Vegetable Production and Consumption in the Pacific Region

#### Introduction

The purpose of this survey is to collect available information regarding the horticulture value chain, fruit and vegetable consumption and the importance of fruit and vegetables in local diets. This information will be analyzed and presented at the workshop, and should serve as background and a baseline for planning and formulating interventions in support of a national initiative to promote fruit and vegetables for health at individual country level. It is planned that programme managers and/or policy-makers of the sectors of Horticulture, Public Health/ Nutrition and Education, representing English-speaking countries of the Pacific Region, will participate in the workshop (total three participants per country). This questionnaire should be completed jointly by state actors from representatives of the agriculture, nutrition/health and education sectors, if possible. We request that it be filled out and returned to us by **20 June 2014**, at the latest.

#### A. Identification

[Please specify your name, which country you will represent at the PROFAV workshop, and the name of the people who took part in this assessment:]

1. Country:	2. Name of Institution/ Organization:	
3. Information supplied by :		4. E-mail :
5. People involved in this assessment :		
Name	Institution	E-mail
i.		
ii.		
iii.		

## B. National PROFAV platform

- A national PROFAV platform is composed by representatives from key ministries, including agriculture, health/nutrition and education as well as other related ministries, including also representatives of the private sector and NGO's as appropriate.

### 1. Does your country have platform for promoting fruit and vegetable production, supply and consumption?

- Yes or no? (Answer: \_\_\_\_\_ )
- If yes, which areas' representatives are involving in the coordinating team? Choose all involving sectors and specify the contact point of representatives in the box of bottom.
  1. agriculture/horticulture sector
  2. nutrition sector
  3. public health sector
  4. education sector
  5. financial sector
  6. private sector
  7. farmer's unions, smallholders' associations (representing producers)
  8. consumers' associations
  9. academic sector(especially for programme design and monitoring)
  10. local community leaders
  11. women's groups
  12. other
- If no, please specify contact points of related public entities dealing with horticulture, nutrition and education in the box of bottom.



**C. Identification of national goals and objectives, and general barriers**

**C.1. Does your country have national goals and objectives to promote fruit and vegetable production, supply, and consumption?**

- If yes, please specify

- Overall goal :
  
  
  
  
  
  
  
  
  
  
- Health goal :
  
  
  
  
  
  
  
  
  
  
- Nutrition goals :
  
  
  
  
  
  
  
  
  
  
- Production goals :
  
  
  
  
  
  
  
  
  
  
- Distribution goals :

- Are these goals distinguished between short-, medium- and long-term objectives? If distinguished, please specify?



**C.2. Please, rank five general barriers to fruit and vegetable promotion among examples and describe them in detail:**

(1)
(2)
(3)
(4)
(5)

**<Examples>**

- climate – seasonality, water availability, extremes of heat and cold, drought, rain;
- lack of horticultural technology and knowledge of management practices;
- competing government priorities(e.g. policies promoting cereal production on arable land or with available irrigation water);
- economic issues – price, income, affordability at a local and individual level;
- attitudes of producers;
- cultural influences on consumers – traditional diets and cooking practices (can be both barrier and facilitating factor), cultural misperceptions affecting dietary preferences(e.g. fruit causes diarrhoea);
- taste and habit formation of diet patterns in childhood;
- lack of awareness/knowledge of benefits of fruit and vegetables, of preparation of fruit and vegetables, of what constitutes a balanced diet as income increases (role of increasing meat/fat consumption), also misperception of advertised health claims of other products (functional foods);
- unhygienic practices in production and preparation of food;
- perception or communication of food-safety risks – chemical or micro biological contamination;
- misinterpretation or distortion of information by the mass media;
- introduction or rapid increase of fast-food culture; ready-to-eat fruit and vegetables are not easily available, but ready-to-eat fast food is easily available;
- competition for funding with other promotion programmes, and with more popular foods;
- social acceptability of fruit and vegetable promotion interventions;
- lack of availability, inadequate marketing facilities;
- negative experiences with overproduction necessitating strategies for diversification, better scheduling, value chain efficiency enhancement, and/or production shifts;
- others

## **D. Activities at national level: Does your country have activities at national level?**

### **D.1. Description of consumer domains**

In order to design effective interventions to improve fruit and vegetable intake, it is essential that the under-consuming population groups are identified and efforts made to understand their consumption behaviours.

All consumer domains differ widely within and between countries. The characteristics outlined below are not meant to be exhaustive, but to provide examples which may guide characterization of consumer and supplier domains in specific countries and areas.

#### **1. For rural smallholders producing fruit and vegetables for own consumption and market supply**

- own production of fruit and vegetables;
- collection of fruit and vegetables;
- exchange of fruit and vegetables for other goods, including gifts;
- often task division between men and women; men produce cash crops, women produce fruit and vegetables for own consumption around the house or in a small garden;
- vegetables consumed are more often home-grown; fruits, if consumed, more often purchased.

#### **2. For Mixed consumers – rural and particularly urban gardeners, but also dependant on market supply**

- occasional fruit and vegetable producers, but their major income is non-agricultural;
- often belonging to low- to mid-income levels;
- may have limited knowledge of the nutritional value of fruits and vegetables and/or a cultural bias against certain fruit and vegetables;
- commonly purchase fruit and vegetables from local market or small shops;
- fruit and vegetables which they grow are limited in range and amount.

#### **3. For Market-dependent consumers**

- dependent on cash economy, most of them living in urban or peri-urban areas thus they have a limited ability to grow food;
- many women in this group work outside the home; hence there is less time available for food preparation and a greater need for convenience and processed food;
- part of food consumption is outside the home, less cooking takes place in the household;
- poor consumers in this group often purchase in small amounts because of lack of cash; hence are not able to benefit from supermarkets offering bulk purchases to reduce costs, resulting in higher food costs;  
many do not have access to conditional transfers (transfers of resources to poor families on condition that they engage in some behaviour, e.g. sending children to school, taking children to health clinics), social safety nets or food aid programmes.

#### **4. Institutional consumers**

- Schools, worksites, hospitals and care facilities, military, prisons, feeding programmes

**D.2. Activities for rural smallholders producing fruit and vegetables for own consumption and market supply**

**D.2.1. Please rank specific barriers in examples to fruit and vegetable promotion for rural smallholders and describe your national situation in detail**

(1)
(2)
(3)
(4)
(5)

**<Examples>**

- \* extreme poverty of producers and consumers
- \* low-quality varieties of crops (no crops improvement)
- \* non-availability of seeds/planting material
- \* human resource and labour constraints
- \* lack of basic enabling knowledge
- \* others, if any

**D.2.2. Choose all activities which should be taken up by your country and mark “x” in the brackets**

**a. Increase and diversify fruit and vegetable production to achieve year-round diversity, safety and quality**

- ( ) Safety and quality to increase intake
  - ( ) safe fruit and vegetable programme
  - ( ) GAP – focus on pesticide use and prevention of contamination
- ( ) Cultivar improvement, selection and promotion: targeting nutrient content, quality, flavour:
  - ( ) promote crops/varieties with high nutrient levels
- ( ) Promoting techniques to extend production season;
  - ( ) phasing production
  - ( ) water

**b. Increase availability and affordability of fruit and vegetables: Build capacity for:**

- ( ) Technologies for post-harvest loss reduction
  - ( ) harvesting technology

- processing technologies
- better storage
- packaging for freshness
- reducing domestic level losses through education of women
- Scheduling and managing production to reduce seasonal gaps and gluts to safeguard producer and consumer price convenience
- Creating new networks to facilitate transport, haulage and marketing
- Increasing small grower involvement and benefit sharing through:
  - promoting small farmer entrepreneurship
  - promoting schemes for transparent price information and fair practices by intermediaries
  - disseminating market information e.g. boards with prices in rural areas
  - direct marketing (promotion of farmers' markets)

**c. Change knowledge, attitudes, behaviour**

- Education programmes – for women, children, farmers, development agents, extensionists, policy makers and planners, managers, subject-matter specialists
- Access to existing information and knowledge – ensure use of proper media
- Behaviour change – facilitated participatory planning
- Social marketing – produce marketing boards, where active, to support groups, programmes, networks

**d. Increase amount of fruit and vegetables consumed, replacing energy-dense, nutrition-poor foods, where needed**

- Use local media (especially radio), competitions, role play, theatre, market-place exhibitions
- Educate mothers about a healthy diet at child-weighing or vaccination clinics; promote fruit and vegetable consumption instead of nutrient-poor foods

**D.3. Activities for mixed consumers – rural and particularly urban gardeners, but also dependent on market supply**

**D.3.1. Please rank specific barriers in examples to fruit and vegetable promotion for mixed consumers and describe your national situation in detail**

(1)	
(2)	
(3)	
(4)	



<Examples>

- \* insufficient land and/or lack of urban/peri-urban land-use policies for horticulture
- \* low income
- \* lack of appropriate technology
- \* inadequate supplies of clean water and thus food contamination risks
- \* others, if any

**D.3.2. Choose all activities which should be taken up by your country and mark “x” in the brackets**

**a. Increase and diversify fruit and vegetable production to achieve year-round diversity, safety and quality**

- Collect, collate and disseminate information on successful gardening programmes
- Foster gardening networks, communities, clubs, etc.
- Make land available for gardening in urban and peri-urban areas
- Organize training and extension programmes on gardening, nutrition, food safety, etc.
- Rescue traditional varieties/indigenous fruit and vegetables

**b. Increase availability and affordability of fruit and vegetables**

- Improve marketing infrastructures
- Promote income-generating programmes

**c. Change knowledge, attitudes, behaviour**

- Organize media campaigns
- Review school curriculum and other national policies and strategies to support gardening and educated about health benefits of fruit and vegetables

**d. Increase amount of fruit and vegetables consumed, replacing energy-dense, nutrition-poor foods, where needed**

- Develop and promote simple small-scale food preservation methods at household level
- Promote recipes using fruits and vegetables

**D.4. Activities for market-dependent consumers**

**D.4.1. Please rank specific barriers in examples to fruit and vegetable promotion for market-dependent consumers and describe your national situation in detail**

(1)
(2)

### <Examples>

- \* high price of fruit and vegetables in retail outlets;
- \* change in employment and lifestyle with urbanization; lack of time for preparation and cooking as urbanization increases and more women work outside the home.
- \* Others, if any

#### **D.4.2. Choose all activities in your country and mark 'x' in brackets**

##### **a. Increase and diversify fruit and vegetable production to achieve year-round diversity, safety and quality**

- Work with peri-urban small-scale producers to identify types of fruit and vegetables that are appropriate for these types of projects;
- Supply-chain improvement projects addressing efficiency from seed/field through market to table with appropriate technological innovation and information systems; need to take account of food safety issues (use of safe water supply);
- Agricultural training in whole range of techniques and issues about efficient and safe production; from production to preparation for sale. This should include education and training.

##### **b. Increase availability and affordability of fruit and vegetables**

- Small scale production/home production, food preparation and selling (for income generation);
- Alternatives for commercialization – promote approaches to complement distribution through supermarket chain;
- Specific policies to support local supply.

##### **c. Change knowledge, attitudes, behaviour**

- Education targeting women and men about:
  - good nutrition and how to achieve this in the diet
  - fruit and vegetables as part of balanced diet
  - importance of fruit and vegetables for tackling micronutrient deficiencies in children
  - prevention of CVD, obesity, cancer etc.
  - safe preparation and culturally-appropriate cooking and storage techniques
- Mass media education campaigns to inform about the benefits of fruit and vegetables for tackling over-nutrition, NCDs and micronutrient deficiencies

##### **d. Increase amount of fruit and vegetables consumed, replacing energy-dense, nutrition-poor foods, where needed**

- Public education campaigns to promote increased utilization of fruit and vegetables in restaurants (education regarding health benefits and how to increase fruit and vegetable sales)

**D.5. Activities for institutional consumers: Schools, worksites, hospitals and care facilities, military, prisons, feeding programmes**

**D.5.1. Please rank specific barriers in examples to fruit and vegetable promotion for institutional consumers and describe your national situation in detail**

(1)
(2)

**<Examples>**

- \* acceptability and feasibility of promotional programmes
- \* interests of the institutional food provider competing with fruit and vegetable promotion
- \* others, if any

**D.5.2. Choose all activities which should be taken up by your country and mark “x” in the brackets**

**a. Increase and diversify fruit and vegetable production to achieve year-round diversity, safety and quality**

- ( ) Linked to institutional feeding programmes organized by the government e.g. for hospitals, camps, armies, schools, correctional facilities, provide seeds and training to help local communities produce fruit and vegetables for feeding programmes
- ( ) Supply-chain-based horticultural development projects to encourage farmers and peri-urban growers in suitable areas to grow fruit and vegetables and benefit from value chains linked to institutional feeding programmes

**b. Increase availability and affordability of fruit and vegetables**

- ( ) School-linked gardens
  - ( ) encourage the use of indigenous fruits and vegetables; teach both boys and girls how to cook
  - ( ) get parents and other adult members of wider school community involved

**c. Change knowledge, attitudes, behaviour**

- ( ) Engage public figures to promote increasing intake of fruit and vegetables
- ( ) Link healthy diet with physical activities/sports
- ( ) Give recognition to NGOs and religious leaders working towards promoting better nutrition
- ( ) Education regarding cooking and preparation of fruit and vegetables for food workers in communities, schools, restaurants
- ( ) Retain or (re)insert nutrition and cooking as part of the school curriculum

- ( ) School gardens – education regarding gardening and balanced nutrition
- ( ) Field trips to local markets or supermarkets to educate school children about fruit and vegetable availability
- ( ) Providing fruit snacks in schools and worksites

**d. Increase amount of fruit and vegetables consumed, replacing energy-dense, nutrition-poor foods, where needed**

- ( ) School food programmes (at school and national levels; whether free, subsidized or paid meals) tailored so that they increase fruit and vegetable consumption by schoolchildren (i.e. as part of balanced diet, not just about under-nutrition), connected with supply-side interventions to promote/support local production
- ( ) Government food programmes to be consistent with national nutrition policies and promote purchase and consumption of fruit and vegetables

**E. Does your country have a “Horticulture Development Strategic Plan”**

- a. No
- b. If ‘yes’, please provide the reference and indicate whether its refers to the promotion of the consumption of fruits and vegetables

**F. Does the country have a Food Composition Table (FCT) giving the nutrient values for Fruit, Vegetables and other food items?**

- a. If ‘no’, what FCT are you using? (e.g. of any International Organization, any other country, etc)



- b. If 'yes', please provide the name of the FCT and contents.

**Are there any recent or ongoing studies on the nutrient values of Fruit and Vegetables?**

- a. No
- b. If 'yes', please provide the complete references of the reports and studies:

**G. Does the country have Food-based Dietary Guidelines?**

- a. No
- b. If 'yes', please provide the name and contents of the Guidelines and if it is online, please provide link:

## H. National Programme for the Promotion of Fruit and Vegetable Consumption

1. Is there, or has there been, a campaign to promote the consumption of Fruit and Vegetables, or is one planned?

a. No

b. If 'yes', please specify:

2. In your opinion, what would be the main target groups of population concerned by a national programme for the promotion of fruit and vegetable consumption (e.g. school children, mothers, youth, urban or rural households, HIV/AIDS-affected, other)

Please indicate the three priority target groups:

Group 1:

Group 2:

Group 3:

3. For each of these priority target groups, please specify an overall goal and up to three specific results which could be linked with interventions or activities:

For example, an overall goal might be something like 'increase fruit and vegetable consumption', whilst specific goals might be related to specific target groups, e.g. for Urban population in slum areas a specific result might be to increase the consumption level to 1 (two servings per day)

List overall goals by group and up to three specific expected results for each over a period of 3 years:

Target	Overall goal	Specific results
Group 1:		1.
		2.
		3.
Group 2:		1.
		2.
		3.
Group 3:		1.
		2.
		3.

**I. Ideas for the fine-tuning of the agenda of the workshop**

1. In your opinion, what could be the most efficient intervention pathway(s) for involving each of the target groups suggested in Section D above?

**Group 1:**  
Suggested intervention pathway(s):

**Group 2:**  
Suggested intervention pathway(s):

**Group 3:**  
Suggested intervention pathway(s):

2. In your opinion, which stakeholders (from the public and private sector as well as NGOs and civil society) should be involved in the implementation of this kind of programme for the promotion of fruit and vegetable consumption? As far as possible, specify their role(s) and their potential action pathway(s).

For queries about this questionnaire, please contact: [Minwook.Kim@fao.org](mailto:Minwook.Kim@fao.org)

*THANK YOU FOR YOUR COLLABORATION!*





# References

- Bourke, R.M. & Harwood, T., eds.** 2009. *Food and Agriculture in Papua New Guinea*. ANUE Press, The Australian National University, Canberra.
- FAO.** 1992. *World Declaration on Nutrition. 1992 International Conference on Nutrition*. Rome. (Available at <ftp://ftp.fao.org/es/esn/nutrition/ICN/icndec.htm>)
- FAO.** 1996. *World Food Summit*. Rome. (Available at [http://www.fao.org/wfs/index\\_en.htm](http://www.fao.org/wfs/index_en.htm))
- FAO.** 2002. *Report of the World Food Summit: Five years later*. Rome. (Available at <http://www.fao.org/docrep/MEETING/005/Y7106E/Y7106E00.htm>)
- FAO.** 2004. *Fruit and vegetables for health: Report of a Joint FAO/WHO Workshop, Kobe, Japan*. Rome.
- FAO.** 2006. *Agriculture 21 Magazine*, 0606: 2.
- Mercer, P.** 2007. South Pacific is 'fattest region' (available at: <http://news.bbc.co.uk/2/hi/health/6396111.stm>).
- Secretariat of the Pacific Community.** 2010. *NCD Statistics for the Pacific Islands Countries and Territories*. Suva, Fiji.
- Tasmanian Government.** 2013. *State of Public Health. Population Health, Department of Health and Human Services*. Hobart.
- United Nations.** 2014. *The Millennium Development Goals Report 2014*. New York, USA.
- UNCTAD.** 2012. *The least developed countries report 2012: Harnessing Remittances and Diaspora Knowledge to Build Productive Capacities*. New York & Geneva, UN.
- WHO.** 2010. Pacific islanders pay heavy price for abandoning traditional diet. *Bulletin of the World Health Organization*, 88(7): 484-485.
- WHO.** 2011. *Papua New Guinea country profile 2011*. Papua New Guinea.
- WHO.** 2013. Country Cooperation Strategy at a glance: Pacific Island Countries (available at <http://apps.who.int/iris/handle/10665/136831>).



ISBN 978-92-5-108879-1



9 789251 088791

I4935E/1/09.15